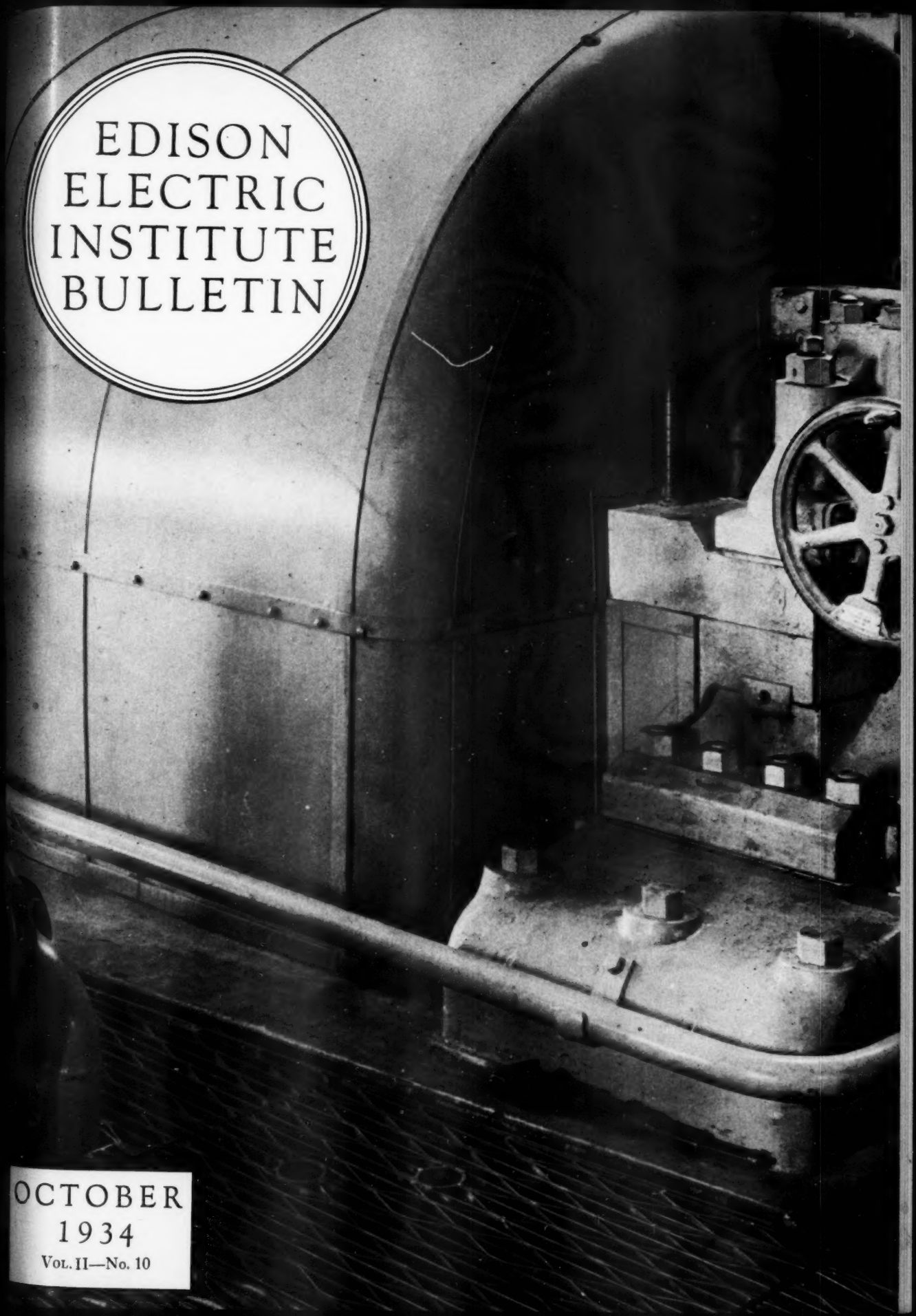
EDISON ELECTRIC INSTITUTE BULLETIN



OCTOBER
1934
VOL. II—NO. 10

STATISTICAL DATA OF THE ELECTRIC LIGHT AND POWER INDUSTRY

Compiled Monthly by the Edison Electric Institute—Covers 100% of the Industry

DURING THE MONTH OF AUGUST

	1934	1933	%
Kilowatt-hours Generated* (net)			
By Fuel	4,972,656,000	4,503,222,000	+10.4
By Water Power	2,256,617,000	2,570,881,000	−12.2
Total Kilowatt-hours generated	7,229,273,000	7,074,103,000	+ 2.2
Additions to Supply			
Energy purchased from other sources	157,268,000	236,359,000	−33.5
Net International Imports	81,714,000	57,870,000	+41.2
Total	238,982,000	294,229,000	−18.8
Deductions from Supply			
Energy used in electric railways departments	47,722,000	50,312,000	− 5.1
Energy use in electric and other departments	110,958,000	99,342,000	+11.7
Total	158,680,000	149,654,000	+ 6.0
Total Energy for Distribution	**7,309,575,000**	**7,218,678,000**	**+ 1.3**
Energy Lost in Transmission, Distribution, etc.	**1,327,310,000**	**1,346,827,000**	**− 1.4**
Kilowatt-hours Sold to Ultimate Consumers	**5,982,265,000**	**5,871,851,000**	**+ 1.9**
Sales to Ultimate Consumers (kw-hrs)			
Domestic Service	957,251,000	863,679,000	+10.8
Commercial—Small Light and Power (Retail)	1,080,325,000	1,014,104,000	+ 6.5
Commercial—Large Light and Power (Wholesale)	3,336,566,000	3,400,587,000	− 1.9
Municipal Street Lighting	166,514,000	166,195,000	+ 0.2
Railroads—Street and Interurban	333,827,000	309,232,000	+ 8.0
Railroads—Electrified Steam	54,257,000	55,654,000	− 2.5
Municipal and Miscellaneous	53,525,000	62,400,000	−14.2
Total Sales to Ultimate Consumers	5,982,265,000	5,871,851,000	+ 1.9
Total Revenue from Ultimate Consumers	$148,464,000	$143,441,700	+ 3.5

DURING TWELVE MONTHS ENDING AUGUST 31st

Kilowatt-hours Generated* (net)			
By Fuel	52,855,819,000	45,783,393,000	+15.4
By Water Power	30,377,995,000	31,624,803,000	− 3.9
Total Kilowatt-hours generated	83,233,814,000	77,408,196,000	+ 7.5
Purchased Energy (net)	3,274,978,000	2,769,767,000	+18.2
Energy Used in Electric Railway and Other Departments	1,994,142,000	1,937,437,000	+ 2.9
Total Energy for Distribution	84,514,650,000	78,240,526,000	+ 8.0
Energy Lost in Transmission, Distribution, etc.	**14,593,657,000**	**14,171,193,000**	**+ 3.0**
Kilowatt-hours Sold to Ultimate Consumers	**69,920,993,000**	**64,069,333,000**	**+ 9.1**
Total Revenue from Ultimate Consumers	$1,813,966,300	$1,778,179,700	+ 2.0
Important Factors			
Percent of energy generated by waterpower	36.5%	40.9%	
Average pounds of coal per kilowatt-hour	1.45#	1.46#	
Domestic Service (Residential Use)			
Average annual consumption per customer (kw-hr)	621	601	+ 3.3
Average revenue per kw-hr (Cents)	5.35¢	5.54¢	− 3.4
Average monthly bill per domestic customer	$2.77	$2.77	0.0

BASIC INFORMATION AS OF AUGUST 31st

Generating Capacity (kw)—Steam	23,913,900	24,025,800	
—Water Power	9,006,600	8,975,300	
—Internal Combustion	468,100	461,700	
Total Generating Capacity in Kilowatts	33,388,600	33,462,800	
Number of Customers			
Farms in Eastern Area (Included with Domestic)	(516,659)	(505,230)	
Farms in Western Area (Included with Com'l—Large)	(209,764)	(204,200)	
Domestic Service	20,331,779	19,751,663	
Commercial—Small Light and Power	3,712,571	3,677,956	
Commercial—Large Light and Power	530,413	528,383	
All Other Ultimate Consumers	66,366	62,530	
Total Ultimate Consumers	24,641,129	24,020,532	

*By courtesy of the U. S. Geological Survey with deductions for certain plants not considered Electric Light and Power Enterprises.

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EDISON ELECTRIC INSTITUTE BULLETIN

Volume II OCTOBER, 1934 No. 10

ROMANTICISM AND REALISM IN ECONOMICS

By W. C. MULLENDORE

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No right-thinking person enjoys or desires a continuance of conditions which produce unemployment, poverty, uncertainty and mental and social distress. Some people, and particularly the enthusiastic neophytes in the field of social reform, who have but recently discovered that economic security is the big problem of mankind, arrogate to themselves an exclusive devotion to and interest in social welfare; but practical people, experienced in the world of affairs, always have been interested in social security and are fully cognizant of the fact that social security and business health are interdependent. We hope that we are sensible and reasonable people and good citizens, as well as business people, and as such we are interested in social progress, as well as in that improvement of business conditions without which we can achieve no real and lasting improvement and advancement of social welfare. If there is disagreement, it is as to the best methods and means of attaining this objective, and not as to the objective itself.

It is commonly admitted that business has been sick, and it is still ailing. It is indeed doubtful whether a stable improved basis for that exchange of goods and services, of which business consists, has been established, and whether we have more or less obstacles and interferences which impede and slow down business activity. To the extent that this exchange of goods and services, which measures the health of circulation in the business world, is interfered with, is artificial and unbalanced, we have a continuing menace which affects the lives and happiness of all the people.

There are, and for a long time there have been a great variety of diagnoses and suggested remedies. There is one school of doctors who hold that the

MR. MULLENDORE

cause of our business ills is to be found in the stubbornness, the incompetence, the stupidity and dishonesty of the leaders of business, and that the remedy will be found in deposing the old leadership and substituting new personnel. In connection with this diagnosis, it is also suggested that the motivating forces which they find has heretofore dominated business, such as the profit motive or the desire for the accumulation of capital, are wrong, and that we must establish a new order in which the desire to serve for the sake of service alone shall be substituted for the desire for profitable exchange. The extremists of this school go so far as to say that the old system of Individualism must be discarded as being outworn and no longer workable under modern conditions because the problems of production have now been solved. They maintain that plenty for everyone is available; that our problem lies in the field of just distribution, but they fail to make clear their basis and means for determining distribution. They further maintain that the old system has resulted in such concentration of wealth in the hands of a few, and such parsimonious distribution amongst the many that its continuation threatens starvation in the midst of plenty, which can be avoided only by a radical change in the control of production and distribution whereunder employees of government will be charged with the duties of production and of controlling distribution.

Another school maintains that we cannot safely dispense with the old incentives to human effort; that we have not an absolute plenty but only a potential plenty in America today, and that this plenty can be realized and provided only by holding out a promise of reward as an incentive to human effort and exertion; that the old system of production has not failed but that in a period of great world disturbance and by reason of the impact of many new methods, inventions and discoveries, men and women throughout our country failed to heed the rules of this old system and indulged in unwise speculation, overspending on luxuries and underspending on necessities, and generally indulged in practices violative both of the rules of the system and of commonsense. They further maintain that the road to recovery of business health is through a return to the observance of the old established rules of honest service, of fair exchange, honest observance of contractual obligations, and that no system can be devised which is foolproof against excesses; that instead of changing to a system which has often failed

in experience, we should observe the rules of and adhere to a system which has at least a record of fine accomplishment in the upbuilding of a great civilization.

The issue thus joined between these two schools of thought, while a very old issue, is with us today in acute form, and it is that issue to which we, as citizens interested not only in business but in social welfare and human progress, must give much of our serious thought and attention if we are to meet our obligations as citizens and as business men.

Romanticism and Realism Defined:

In my study of the theories and philosophy of advocates of the new scheme for society, I have detected what seems to me a great deal more of romanticism than of realism.

What is Romanticism? It is a term generally applied to a school of literature which rebels against the portrayal of the unpleasant facts of life and emphasizes instead the heroic and sentimental. It arose as a reaction against the stern and restrictive formality of so-called classic literature. According to Webster it deals with the "spirit of chivalry, adventure and wonder" and it is preoccupied with the "picturesque and suggestive aspects of nature, and with the passionate in life." Romanticism is not so much concerned with the facts as with telling a good and beautiful story which has a happy ending; and where the facts interfere with the objective of a happy ending, resort is had to the imagination. The heroine is steered around the pitfalls of reality through the simple process of imagining the intervention of a good fairy or a dashing hero who triumphs over the forces of evil.

The Realist in art and literature is opposed to the Romanticist because he lays stress on "the rendering of literal fact," "without selection either of subject or detail in the interest of preconceived ideals." The Realist takes life as he finds it and portrays it without idealization or resort to imagination as a means of escaping reality. The Realist in portrait painting insists on portraying the evil eye and the sensuous mouth if they are before him in the subject which he is painting; whereas the Romanticist will retouch the painting to eliminate the undesirable and to emphasize the desirable traits of character. Most of us would prefer to have our portrait painted by the Romanticist.

Over the door of the Post Office building in New York City, this statement appears, carved in the beautiful granite:

"Neither snow nor rain nor gloom of night shall stay these messengers from the swift completion of their appointed rounds."

It is said that an engineer recently remarked after he had read that beautiful sentence: "Why didn't they simply say: 'The mail will be delivered even in bad weather.'" There we have the Realist's rendition of a romantic sentence.

Most of us like the romantic not only in the make-believe world of the theatre and of fiction but even in the political and economic world. We like plain statements of fact dressed up in fancy language. We prefer when possible to cover up the dross with gilt and rose.

Now, Romanticism is all very well in art and in the make-believe world, but it may be dangerous in the real world where facts count. There the romantic approach may not only confuse but it may mislead. It may arouse passions and prejudice where calm commonsense and plain honesty would be much safer because they would dictate the safe and sane course as against the course which conceals our mistakes until our financial or economic condition is much worse than it would have been had the facts been faced with honesty in the first instance. He may not like the plain and literal truth told in simple, concise language by the Realist but in affairs which concern our daily bread and butter and the welfare of our children the staid and prosaic is often the wisest.

The politician in a democracy is notoriously romantic in his dealing with facts. When the office seeker is appealing to the mass of the voters, it usually serves his purpose best to cast the "dear people" in the role of heroine who is to be saved by the hero. Of course, we cannot have a hero without having a villain, and the politician is always ready with the villain. If there is no real villain he uses the medium of the romantic writer, imagination, and creates a very repulsive villain.

A period of depression is always a prolific breeder of these imaginary villains, because there are then so many woes and complaints that a great many villains must be rushed forward by the politician so that he as hero may have the great distinction of saving us from them—always after he is installed in office.

The Villains:

It may be profitable, therefore, for us to take a realistic look at some of the villains which are said to be responsible for our present plight, because if we are asked to pursue merely romantic villains in our search for a way out of the depression, we may become lost in our pursuit of these imaginary creatures and find ourselves in a worse plight than before. Let us then look, for example, at the villains of "false leadership," "profit motive" and "concentration of wealth," in an endeavor to find out what substance there is to them.

False Leadership:

Who are these false leaders whose leadership brought on the depression? If you were a leader, did you consciously mislead people into situations which injured them? If you were not a leader, what leader did you follow? If you followed the advice of someone who advised you badly, as we see conditions now, did that person wilfully advise you badly, or was he or she also fooled by some other leader? Were the leaders the speculators in Wall Street, and if so, what speculators? Several million American people were buying and selling stocks on the exchanges, and this mass buying and selling made what we now realize was a foolish "bull" market which elevated stocks far beyond their real value. But were all these people who made this market, leaders, and if not whom shall we designate as the followers and whom the leaders? There were a great many men who warned the American people long before 1929 that we were in the midst of a boom that would end in a collapse. Were they leaders? Or were these false leaders only those to whom we listened, and did we listen only to those who told us what we wanted to hear?

Then again most of us bought more luxuries and spent more money foolishly on amusements and gadgets than we could really afford to spend. And that over-stimulated spending obviously contributed to the false appearance of prosperity. Who led us into those mistakes? Was it the salesman who sold us these goods and services? If so, the leaders were myriad in number.

We borrowed more money than we should have borrowed. We used this borrowed money to buy more stocks or more luxuries than we should have bought. Was it the lender who led us into this mistake? Why should the lender and the seller bear all the burden of villainy while the buyer and the borrower are excused from their part in a transaction in which at least two took part? It takes two to make a bargain

and if there had been no unwise buyers there would have been no unwise sellers.

In my search for these false leaders, these villainous money-changers, as a Realist I am bound to admit that I have the greatest difficulty in identifying these false leaders who caused our trouble. And because I have so much difficulty in finding them, and because I find so many millions of people involved in these mutual transactions which contributed to the depression, I have more than a suspicion that there is a great deal of the Romantic about this "false leadership" business. I rather suspect that all of us together made mistakes; that we did not listen to the voice of reason; that we were affected by a mass hysteria. I fear that this blaming others whom we call "business leaders" is resulting in the destruction of self-reliance and of that confidence in each other without which there can be no real recovery.

Of course there were men of prominence in the business world who were mistaken; there were some who were deliberately crooked; and there were hundreds of thousands who were simply foolish. But I have seen no proof that it was the dishonesty of the few prominent men who have been paraded before us as a horrible example which caused the distress and the maladjustment of this depression. The guilty few should be punished but exceptional instances of the misuse and perversion of positions of trust in business does not condemn all business. Governmental positions of trust also are occasionally violated. False promises are sometimes made to gain public office. False and even fraudulent representations are sometimes made by public officials in the promotion of governmentally financed projects. Broken hearts and blighted lives of individuals are not infrequently the result of unsound governmental ventures and unfair treatment of governmental employees. Government officials have been known to repudiate governmental obligations and to disregard their oaths to preserve Constitutional rights. Yet we do not destroy governments, nor condemn all public officials because of these exceptional acts.

Profit Motive:

Now let us look at another villain, "the profit motive." What is the profit motive? I understand it to be that motive which leads most of us to expect a fair and honest return in our exchange of goods and services. What is profit? It is not ill-gotten gain. Profit is synonymous with valuable results; benefit; useful consequences. If we make a profit on a transaction it does not mean that we have swindled someone. It means that we have given value received. In the great mass of daily transactions in which a profit is involved, the profit is mutual. We desire to exchange something which we have for something that the person with whom we trade will give us in that exchange. In the publication business we classify as profits the excess of our receipts over and above operating expenses and fixed charges—the payment for the use of money invested in the stock of the company—the dividends. In order to induce people to invest their money in the equipment which serves the consumers these investors must be promised some payment for the use of their savings, and that payment is honest and proper and necessary. Unless the payment is made, the savings will not be forthcoming. These investors are induced to save and to invest by the profit motive —by the expectation of a fair payment for their denial and sacrifice.

There you see the profit motive in operation. It is not illegitimate nor improper. It is both eminently proper and legitimate, and it serves human welfare because by reason of that inducement money is saved, and useful goods and services are provided for the benefit of the people who desire to exchange other goods and services for them also at a profit.

Of course, profits are larger in some lines of business in which the risks are also greater, and in which in order to induce investment of savings, or the risk of savings, the promised reward must be greater. In activities in which there are great risks such as drilling for oil, great profits are made and great losses are sustained. On the average, however, in all lines of business, when we balance profits against losses, there are no exorbitant returns. A recent study indicates that the average annual return in manufacturing industries over a series of years was only 3.8 per cent.

When we look realistically at the romantic phrase "substitution of the service motive for profit motive," what does it mean? Does it mean that we shall announce to all that in the future they may expect no reward for endeavor except the knowledge that they have performed a useful service? And when we receive the reply from the realist that "I can't eat on that," what further reward are we to offer and who shall determine the amount and character of the further reward? The so-called "profit motive" recognizes the very evident fact that the stimulus to endeavor with the majority of mankind is the offering of a reward, and that reward must be commensurate with the effort and risk which is demanded. The substitution of a "motive more noble than the mere profit motive" sounds well, but those of us who realize that the stoppage of the exchange of goods and services spells disaster have the right to ask that before this experiment is entered upon, we be given some assurance that it will work; that is, that the substituted motive shall be one which common sense and human experience tell us will result in the doing of the work which must be done if economic society is to hold together and endure.

It is true that America is equipped to produce enough goods and services to supply her population with the necessities and some of the luxuries of life. That is the fact behind the repeated assertion that "we have plenty for everyone." But let us remember that this p l e n t y is only a POTENTIAL PLENTY, and between the potential and the realized plenty there must intervene the intelligent application of energy to raw materials—human effort and human intelligence must be exerted and properly directed. Our fields, our mines, our forests, our factories, our public utilities, our distribution and construction facilities do not run themselves. This plenty must be produced and distributed, equipment must be maintained and replaced, and the whole complicated mechanism must be kept running, or we will starve in the midst of this so-called plenty. Workmen must have tools; they must work through well-planned organization and under intelligent direction. Some of us must do hard physical work; others must do hard mental work, and there must be a combination and coordination of all these factors.

These are simple facts, they are commonly recognized facts, and yet what is it that induces this expenditure of effort and intelligence? What is it that has produced this modern economic society with its complicated interdependence? What makes it function? What indeed but this same decried profit motive? And when someone says in response to these plain, common-sense facts: "But I hate to think that human beings are so selfish that they will not work except

for sordid profit," are they not merely being romantic and saying in effect: "I hate to think that human beings are governed by human instincts?"

No doubt it is fun to play at the game of reforming human desires and instincts; it may be pleasurable to attend teas and cocktail parties and play at being liberal and radical. I can understand the "kick" which the wealthy sons of hard-working forbears get out of the dilettante discussions of the decadence of the capitalistic system and the sordiness of the profit motive. I can even understand how the young college professor who has obtained his living from a salary paid by an institution endowed by capitalists can conclude that he has nothing to lose by endeavoring to set up a system under which he will be paid from some other source. But I can't understand how the people who are doing the work of the world, who are under the necessity of providing for the security of themselves and their children can complacently sit by and applaud or endorse romantic ideas which threaten the very foundations of a society which has produced the greatest civilization which the world has yet seen.

Unequal Distribution of Wealth:

There is one idea which runs through most of the criticisms of the old economic order, and it is that the profit motive results in the unequal distribution of wealth, and that it is this unequal distribution of wealth from which most of our distress springs. There is more or less constant repetition by those who advocate the abolition of the system of individualism or capitalism of the statement that a small percentage of the people control the great majority of the wealth of the country. Sometimes it is stated that "4 per cent control 80 per cent of the wealth"; at other times that "2 per cent control 90 per cent of the wealth"; and it is argued that if this wealth were equally distributed our most serious economic troubles would disappear because there would then be enough for everybody; poverty would disappear, and every one would be much happier.

Let us then talk about the Distribution of Wealth problem.

First of all, is it a fact that a very small percentage of the people control practically all the wealth of the country? What is meant? A great many people who hear these statements and accept them as facts think that what is meant is that this small minority who are said to control or own, take almost all of the earnings of agriculture and of industry and consume them, leaving to the great mass of the people only the small percentage which remains. Now when we stop to think of it, that is obviously not true, because there is a limit to what one individual can eat and wear, and there is a limit to the number of houses which that individual can occupy.

It is physically impossible for 4 per cent of the people to eat 80 per cent of the food, wear 80 per cent of the clothes and occupy 80 per cent of the houses. Neither do 4 per cent of the people run 80 per cent of the automobiles, nor exclusively occupy 80 per cent of the motion pictures or places of amusement.

The true test, therefore, of the distribution of wealth is the manner in which these things which industry produces are distributed. What becomes of these things which are produced? Well, no longer ago than March 5, 1934, the President of the United States said:

> "It is worthwhile keeping in the front of our heads that the people in this country whose incomes are less than $2,000 a year buy more than two-thirds of all the goods sold here."

Now, since more than 80 per cent of our people have incomes of less than $2,000 a year, if the President was right in his statement, and available statistics indicate that he was, then two-thirds of the real wealth of the country, the products of industry, are distributed amongst this 80 per cent who have incomes of less than $2,000, and the complaint that 80 per cent of the wealth is distributed amongst only 4 per cent of the people turns out to be a myth. And it also follows that those of our citizens who are so shocked by the common erroneous statement about the distribution of wealth that they are willing to abandon the old order, should hesitate before they abandon it because they are proceeding on an entirely erroneous idea about the distribution of wealth.

Someone suggests, however, that the true test of the distribution of wealth is not the distribution of the products of industry but the distribution of income, that is, of the earnings as measured in dollars each year. Cash income distribution is not a very satisfactory measure of the true distribution of wealth because it does not take into account the great number of free services such as public education, recreation facilities, medical and hospital service, free entertainments and amusements provided at public expense; nor does it take into account the food and housing facilities which the one-fourth of our population which live on farms receive without current cash expenditure and which consequently does not appear in figures as to distribution of cash income.

However, let us look at the figures as to the distribution of incomes, keeping in mind that they are not a true measure of the distribution of wealth in its real sense. The figures compiled by the National Bureau of Economic Research in 1918 showed that in that year 81 per cent of the national income was distributed to the 98 per cent of the people who earn less than $5,000 annually. Thus 19 per cent of the total income went to the 2 per cent gainfully employed who receive $5,000 and over.

The latest official figures available are for the year 1932, when there was a total of $39,365,000,000 of goods and services produced. According to the National Industrial Conference Board, of this total income produced through the use of all the capital that had been invested in all kinds of business, $31,533,000,000, or about 80 per cent was paid out to persons working for wages and salaries, and only $7,832,000,000, or about 20 per cent was left over for the labor and management of all people in business for themselves and for the payment of interest and dividends on all the capital invested in all business. Furthermore, of the amount paid out in interest and dividends $6,925,000,000, or more than 80 per cent went to savings banks, life insurance companies, etc., and to individuals with incomes of less than $10,000.

Suppose now that the $907,000,000 which went to individuals having incomes of more than $10,000 had been distributed equally among the 80 per cent having incomes of less than $2,000, or say 40,000,000 people. These 40,000,000 would then have received an increase of about $23.00 per person in their annual income. This figure gives us some measure of the deprivation caused by the so-called concentration of wealth. Would the addition of $23.00 to the annual income of each of these 40,000,000 have contributed greatly to the "more abundant" life? Would it have solved their problems? Obviously not. But it would probably have meant that there would have been less capital in the world the following year, less work and less income for the very group whom we are interested in benefiting, because it is the capital accumulated by

those having incomes above $10,000 which can be risked in new ventures and developments which add to the total of goods, the total of work and hence to the total for all.

There is a still more important correction to make in this common conception about the distribution of wealth to these people in the higher brackets of income, and that involves again the inquiry as to what the wealthy do with their earnings. Do they eat them? No. Do they spend their all on fine clothes and fine houses? No. Then do they keep this income and these earnings away from the rest of us by piling them up in the form of gold and burying them in their cellars or wherever it is that the hoarder hides away his wealth? No. What then do they do with it? Well, first of all they pay enormous income taxes. In the years 1928 and 1929, more than two-thirds of the total income tax collected was paid by those having incomes of $5,000 and over, which means that in 1928 this comparatively small group paid about $800,000,000 of the total of $1164 million dollars collected by the Federal Government from individuals. It is interesting to note that while there were upwards of 45,000,000 people gainfully employed in 1929, there were less than 1/10 of that number of income tax returns filed, and either no income tax or only a nominal amount were paid by the great majority of those filing returns.

Hence the wealthy pay through the income tax and through other forms of taxes on property to which they hold title, the great proportion of the costs of government. What else do they do with their money? Well, they furnish the bulk of the money for endowments of schools, colleges, public libraries, hospitals, art institutes, symphony concerts, and other similar cultural institutions. The bulk of the money collected by Community Chests and for the support of other private charitable endeavors must likewise come from the wealthy. In short, much of the income which they collect is turned back to be enjoyed by others who do not have large incomes, and thus tend to supplement the real distribution of wealth to the less fortunate.

Then again, suppose the rich man tries to spend his money more or less selfishly: He builds a fine home and buys a yacht. He employs large staffs of servants and spends great sums on entertainment. In building those structures, in providing entertainment, in running his yacht, or whatever he does to entertain and amuse himself and his friends he must employ other people and buy the goods and services of other people; and in so doing he must of necessity distribute a large share of his income to these other people who provide the goods and services. Even in obtaining the food and wine and liquor and clothes which he consumes he must purchase the services and the goods of others, and thus distribute the wealth which he possesses to these others.

Finally, what becomes of the surplus income or earnings of the wealthy after their taxes, charities and living expenses are paid? Generally speaking, it is used for productive purposes. To be of any use, that capital must be put to work and, being put to work in factory, mine or distribution facilities, it adds to the sum total of goods available for distribution. It is from the surplus accumulations of those who save beyond their daily consumption needs that the productive machinery of the country is provided. And the saving grace about investment in productive machinery is that it must be used for production in order to have value. The more goods there are for distribution, the more wealth there will be for all. Competition for a share of the consumer's dollar, competition for a market, will take care of price. But if accumulation of wealth, and hence of surplus were stopped, if everything were consumed as produced, we would have no additions to production and distribution facilities and hence no addition to general material well-being. That is the secret and the justification of capitalism. It holds out the lure of profit to induce accumulation, and when accumulation occurs, we must share in the distribution resulting from its use.

The point of all this is that the idea of the distribution of wealth is a very complex idea and when those who would abandon the capitalist system tell us that the cause of our trouble lies in the fact that the wealthy consume all the earnings, and leave so little for the rest of us that we are poor, we find when we stop to inquire and to analyze that the facts simply do not prove the charge. Yet from the false assertions and conceptions about the distribution of wealth arise so many of the false remedies which are advanced to cure our social and economic ills. From a wrong diagnosis of illness there too often comes a fatal treatment, and it applies in economic affairs even more often than in medicine.

Theodore Roosevelt, speaking at Minneapolis, Sept. 2, 1901, said:

"It is probably true that the large majority of the fortunes that now exist in this country have been amassed not by injuring our people, but as an incident to the conferring of great benefits upon the community; and this, no matter what may have been the conscious purpose of those amassing them. There is but the scantiest justification for most of the outcry against the men of wealth as such; and it ought to be unnecessary to state that any appeal which directly or indirectly leads to suspicion and hatred among ourselves, which tends to limit opportunity, and, therefore, to shut the door of success against poor men of talent, and finally, which entails the possibility of lawlessness and violence, is an attack upon the fundamental properties of American citizenship.

"Our interests are at bottom common; in the long run we go up or down together."

I would not contend that wealth is in fact equitably distributed. There are many examples of people obtaining more than their fair share. There is an element of luck, as in the case of gambling or in the event of an oil or gold discovery. There are many instances of individuals taking an unfair advantage. But the question is not whether there are instances of inequality and unfairness under the capitalistic system. The question is whether the only alternate which is proposed, which is Socialism or Communism in some form, produces greater material well-being for the people as a whole; whether these other systems promise increased production or decreased production, increased effort or decreased effort. After all, if the goods and services are available in quantity and in ever-increasing quantity, as they are under the capitalistic system, the whole of the people will have more than they will under a system which stifles production and puts a premium on decreased effort.

So far as I can see from a realistic standpoint the alternate systems promise the distribution of wealth, but they achieve a wider distribution of poverty. I prefer to stick by a system which produces plenty even if it results in some unequal distribution rather than to change to a system which produces scarcity for all.

Planned Economy:

Let us pursue the subject a little further: We are told that the remedy for the wrongful distribution of wealth and the supposed concentration of wealth into a few hands is to have the government take possession at least of

all the basic industries and to allow no private ownership. Thus we are told that with the ownership of the farms, the mines, the railroads, the utilities, and the basic manufacturing plants in the hands of the government, the products of these basic industries can be distributed on the basis of need; or, as it is so often expressed we can substitute the service motive for the profit motive in industry.

Now, as socially-minded people desiring to see an increase in the general welfare we are inclined to approve of the idea of a more equitable distribution on the theory that it will increase the total sum of human happiness; but again, we also wish to inquire how this change is going to work out from a practical standpoint, so we would like to ask some questions: For example, we want to know: "When the government owns all these things, who is to determine how the distribution shall be made?" That is, who will determine the respective needs of the particular individual? Shall everyone have that for which he asks? If so, suppose that some women demand a dozen dresses of different styles, and a dozen pairs of shoes? Will there be enough dresses and shoes so that all who wish may have all they want? Who are to have fine houses? Who are to have the Packards and the Rolls Royces and who the Fords? We are told that this is the age of plenty in which there is no scarcity, that there is enough for everybody, and that under government ownership and a planned economy everyone can be provided for. How much is enough? Can everyone have a town house and a house at the beach and another in the mountains and another in the desert? If not, how shall the more fortunate ones be determined? If everyone is to have the same, will we be obliged to wear uniforms and eat the same food and live in the same size houses? If we are to be directed where we shall live, under what conditions, where we shall work and at what occupations, how can we avoid the misfits and the inequalities which may ensue from assigning some to unpleasant tasks and others to the "soft jobs"? All of these are troublesome questions that are usually ignored by the Romanticist, and as yet there seems to be no satisfactory answer to them.

However, someone says: "Why, of course all that is absurd. No such regimentation and ordering about and enslavement of our people is contemplated by anyone except the crackpots. No serious-minded person advocates any such thing. All that is sought is some better ordering of our economic life, through better planning under governmental control and direction." To which I reply: "Those are just words. What do you mean by government planning?" And someone says: "Why we mean the better planning of production, so there will not be the excess of goods of one kind and a shortage of another." And then we inquire: "How are you going to plan production without also planning and controlling consumption?" Suppose that the planners of production decide that it is houses and furniture that the people need, but the people instead demand automobiles and picture shows. Unless the planner of production is in a position to tell the consumer that he must take that which has been produced for him, just how are we going to avoid unused surpluses in some lines and unsatisfied wants in others?

In the recent study on "Social Trends" made by a distinguished group of sociologists appointed by ex-President Hoover, I find this interesting statement in connection with the problem of consumer selection:

> "With all the much discussed pressure for standardization in American life, there is probably today a greater variation from house to house in the actual inventory list of family possessions and of activities by family members than at any previous era in man's history. The consumer's problem is one of selection to a degree never before known. Industry in turn faces the necessity of competing not merely against rival makes of the same commodity, but, to an unprecedented extent, against the entire field of alternate goods and services in the 'ever-widening arena of strife for a share of the consumer's dollar,' as the Department of Commerce characterizes it."

Now, if the government planner is to meet these variable consumer demands which may shift here and there among the great variety of goods which attract the consumer's fancy, our government planner is going to do some plain and fancy guessing such as we have never before seen. Time does not permit of further exploration of this problem of a planned economy, but so far as I have seen no one yet has suggested how we are to plan production under government authority unless we can also plan and control consumption. And planned and controlled consumption means such regimentation and deprivation of liberty as could obtain only under a dictatorship even more cruel and forbidding than that which obtains in Russia today. Even in Russia, they have found that in order to go on at all under Communism, they must provide for some freedom of choice, some differential in wage and hence in the distribution of the goods and services of industry, which is the beginning of the trek back to capitalism.

I have suggested a few of the practical questions which arise when we look at our economic problems in a realistic rather than a romantic way. It is easy to arouse human emotions of hatred and envy, avarice and greed, but it is much more difficult to stay the forces thus set in motion by the glib promises of the office-seeker and rabble-rouser.

It is true that we have had some false and incompetent leaders in business as in politics, but it is also true that the great majority of American business men, leaders as well as followers, are honest, faithful to their trust and desirous of giving value received in their business dealings. It is true the profit motive has not always worked perfectly and there have been excesses and abuses by reason of over-emphasis on profits, but it is also true that in the main the profit-motive has stimulated millions to great endeavor, to the exercise of more initiative, with the result that the people as a whole have enjoyed a "more abundant" life than would otherwise have been possible. It is true that wealth cannot be equally distributed because we are not all equal in our capacities. Neither has wealth been equitably distributed in all cases, but it is also true that in the great majority of instances the wealthy have contributed more to the common welfare than they have accumulated. And in the use of their accumulated wealth, they have distributed its real benefits.

The great, broad question before the American people today is: Shall we destroy our institutions, change our system, give up our liberty because of some inequalities and imperfections, before we are sure that the inequalities and imperfections under the new system will not be worse than under the old? Shall we destroy the New Deal which America gave to the world in the eighteenth century and adopt as a substitute therefor a system which is not new but which has been repeatedly tried and has always in the end produced universal misery and suffering wherever and whenever it has been tried throughout human history? I, for one, believe that when the American people realize that this is the issue, the overwhelming answer will be that while we desire to improve and

perfect, we emphatically reject the idea of destruction and substitution.

What Has the Realist to Suggest?

Finally, I hear this challenge: "You have now inferentially and directly found fault with a diagnosis and suggested remedy for many of our economic ills. What has the Realist to suggest as an alternate course of action?" That is a fair question and it calls for a frank answer. The Realist has this to suggest:

Let us return to the world of reality and determine the obstacles to recovery on a factual instead of a theoretical basis. If we face the facts we will find that confidence in the future on the part of those who must take the lead has been destroyed. True, a renewed hope and confidence has been temporarily aroused in the mass of the people by the pouring out of government money and by promises which cannot be fulfilled. But, coincident with the arousing of this false confidence, fear of the future has been increasingly instilled in those who must take the risks in the expansion of old and the creation of new enterprises. This destruction of confidence among this large and vitally important group which has the ability for and the qualities of leadership, arises out of a fear of excessive and discriminatory taxation, of policies which arouse serious labor disturbances through attempted forcible imposition of insupportable wage and labor demands and other conditions; a fear of the fluctuating and indeterminate value of the dollar which may lead to disastrous inflation and the destruction of government credit; a fear of the continuance and extension of reform experiments which will nullify the best-laid plans of business and commerce before those plans are well under way. In short, these threats of new and unknown conditions for the conduct of business cause those who should take the risks of further investment to refrain on the ground that if what they have is to be jeopardized, if they must risk the confiscation of all they have in return for the vague promise of only a meager return at the best, the wiser course is to refrain from assuming any additional burden. These unknown and immeasurable risks added to the known and measurable, explain the failure to use readily available credit in renewed activity, and hence the explanation of stagnation in the construction and other capital goods industries.

Let us realize that there is already too much of suspicion and hatred and envy in the world and that the use of high and of low public offices to further arouse these destructive emotions leads to violent and unreasonable actions and demands that can only increase that fear which freezes the channels of trade.

Let us realize that at the best we have a still further period of travail ahead of us, in which we have need of the solid virtues of self-reliance, of thrift, of self-denial; that in this period we must rely upon reason rather than emotion; upon hard and honest effort and self-discipline rather than upon the idea that we can get something for nothing and that the world owes us a living.

Let us realize that when government assumes responsibility for providing work and a livelihood, of providing credit and planning the future of the people, millions of individuals cease using their own initiative, refrain from making any original effort on their own behalf and wait to be told what to do. As a result, the nation loses that incalculable force which comes from the cumulative effect of the individual effort of millions of its citizens endeavoring to adjust their own situations, to find their own way out of their difficulties, to balance their own budget and accept responsibility for their own lives. The strength of America has arisen out of the fact that American individualism sets free the energies of a great people to work out their individual destinies; and the fact that our system imposed individual responsibility on each citizen while at the same time affording to each individual the benefits achieved by his own efforts is the underlying secret of America's unparalleled advancement and leadership in the world. Let us realize that to change this system and return to the old deal whereunder the individual, in return for a sacrifice of his freedom of initiative and action, is relieved of his personal responsibility to provide for his own security, is to abandon America's greatest contribution to civilization and to turn back the pages of history to the days of feudalism, of paternalism, of human slavery, and that stagnation which produces a spread of human misery such as we in the new world have never experienced. Yes, the Realist is interested in social progress and the advancement of human welfare —really interested.

For the sake of our children and their descendants, for the sake of our country and its splendid heritage, let us turn back before it is too late from the false trails which throughout history have repeatedly led to disaster, to the high road of straight and courageous thinking, to the solid virtues of thrift and industry. For the softening influence of the doctrines of ease and dependence upon government, let us substitute the pioneer doctrines of self-reliance, independence and honest endeavor.

CHICAGO MEETINGS OF E.E.I. COMMITTEES

Subsequent to the announcement which appeared in the September BULLETIN, further details concerning the meetings to be held in Chicago in October have been decided upon. These meetings will be held at the Edgewater Beach Hotel. The dates for the various committee meetings are as follows:

Prime Movers Committee—Oct. 22 and 23
Transmission and Distribution Committee —Oct. 22, 23 and 24
Electrical Equipment Committee—Oct. 25 and 26

Transmission and Distribution Committee

During the afternoon of Tuesday, Oct. 23 and the forenoon of Oct. 24 the Transmission and Distribution Committee will hold joint round-table discussion sessions with the High Tension Cable Committee of the Asocciation of Edison Illuminating Companies and the Insulated Power Cable Engineering Association. The Electrical Insulation Committee of the National Research Council will meet with these groups at the forenoon session on Oct. 24.

The Transmission and Distribution Committee will meet on Oct. 22 to receive reports and hold discussions on subjects pending in this committee and to transact other committee business. The afternoon session will be followed by a demonstration which will be in charge of engineers of the Commonwealth Edison Company. A tentative program for this committee follows:

Forenoon of Oct. 23
- AC Network Operating Report—C. T. Sinclair
- New General Electric Network Protector—D. K. Blake
- A New Type of Network Protector—W. R. Bullard
- Underground Transformer Failures—H. R. Searing
- Manhole Covers—J. F. Fairman

Afternoon of Oct. 23
- Cable Operation Report—H. R. Searing
- Vertical Riser Cables—New York and Duquesne Light Company Experience —H. R. Searing

(*Continued on page* 350)

PRESIDENT McCARTER URGES PARTICIPATION IN BETTER HOUSING PROGRAM

All branches of the electrical industry were urged to participate in the Better Housing program of the Federal Housing Administration by President McCarter, of the Institute, at a luncheon meeting held at the Hotel Astor, New York, on Sept. 19.

The luncheon preceded the opening of the Second Annual National Electrical and Radio Exposition at Madison Square Garden. Mr. Frank W. Smith, president of the New York Edison Company, presided. Other speakers at the luncheon were Albert L. Dean, Deputy Administrator of the Federal Housing Administration at Washington; M. H. Aylesworth, president, National Broadcasting Company and R-K-O, and John Kilpatrick, Madison Square Garden Corporation.

President McCarter said in part:

I appear before you today in my official capacity as president of the Edison Electric Institute, to extend to all connected with this great undertaking the greetings of the Institute and its wishes for the great success of the National Electrical Exposition, which is to open this evening, and which I am informed is national in its scope of exhibitors.

It is fitting that in the midst of present wavering in confidence as to the immediate future of business that an undertaking of this kind should very definitely place on record the electrical industry as hopefully optimistic. I do not believe that the electrical era which daily becomes more deeply rooted in the life of the nation is to be turned back permanently by any economic or socialistic force. It may be retarded, but the electrical business will grow to enormous proportions, and will endure, and many of the obstacles to its progress may be surmounted by our own efforts.

I understand that space has been given in the Exhibition to the local committee of the Federal Housing Administration, and that information about the Federal Housing Program can be obtained there, and literature concerning numerous details will be distributed. I desire to bespeak the enthusiastic interest of electrical people in the Federal Housing Program. I believe it is one of the most constructive gestures that has been made toward the solution of business recovery, and for these particular reasons:

Several millions of people in the country that want to work find no opportunity for employment. It is not vital whether the number is eight million, or ten million, or twelve million. The fact is that unemployment is one of the stupendous problems confronting the nation. We are facing a second Winter when unemployment relief is more pressing, and cash reserves for this purpose are being drained.

We are told that approximately two-thirds of the people now on the relief rolls of the country are either normally employed or dependent on those normally employed in the construction industry. It is common knowledge that this basic industry has been hardest hit during these past years of depressed business and depressed spirits. In common parlance, it is flat on its back. Revive the building trades and one of the greatest strides toward business recovery has been taken.

It was this objective that inspired the last Congress to pass on the eve of adjournment the National Housing Act. President Roosevelt took immediate action in setting up the Federal Housing Administration to effect the Titles of that Act. He appointed an intelligent and capable business man as Administrator—Mr. James A. Moffett—formerly vice-president of the Standard Oil Company of California. Regional and State Directors have been appointed, and each State Director is to maintain a permanent office and staff.

* * *

It will be clear to you of the electrical industry that the release of millions of dollars of credit for the construction, repairing and modernizing of buildings cannot fail to benefit our industry directly and indirectly. But let us not allow the selfish motive to dominate our action. We can well afford to center our interest in the broader objectives of the Better Housing Program.

Everyone of us here, whether a manufacturer, wholesaler, dealer or utility representative, is looking forward with hope and optimism to days of business recovery. When you see in your own community large numbers of men busily employed on construction and modernizing of buildings all over the country, in the highways and byways, you may be assured that a business recovery is truly on the way. It will mean that some of our largest industries—lumber, roofing, cement, structural steel, plumbing, electrical and other industries—are more active and will be employing more people. The homes of the men who have jobs will be happier homes, and the spending of these families will be increased so that all industry will share in better business. This picture is not a mirage. It is actually what must happen to motivate prosperity. The electrical industry has the power to make a stupendous contribution to this phase of business recovery.

I am confident that the utility companies will contribute to the progress of the Better Housing Program. May I urge manufacturers and all those interested in the distribution of electrical equipment that they do likewise? Familiarize yourselves and your employees with the Better Housing Program; interest your dealers in electrical equipment which can be financed through loans approved under the National Housing Act; advertise the advantages of electrical equipment; help to organize local modernizing exhibits; give your full and hearty support to the Better Housing campaigns which will be organized in your community for civic betterment, and cooperate with the appointed leader of community campaigns.

If you accept the Federal Housing Program as a challenge to your interest and effort, opportunity lies ahead for profit and service.

GOVERNMENT AND PRIVATE OWNERSHIP

By WENDELL L. WILLKIE

President, The Commonwealth & Southern Corporation

An address at a Dinner Meeting of American Statistical Association, New York, N. Y., Sept. 26, 1934

I do not feel quite at home this evening. To hear two speakers in one evening, both of whom praise privately owned public utilities, is a strange and pleasant phenomenon to me. I naturally listened with great interest to the previous speaker. I do not entirely agree with him. I do not believe that political actions are dependent upon the individualities of men in public office. I think they result from the political manifestations of the people of the country. We who are today charged with being "Tories" and "Bourbons" and disregardful of human rights have been derelict in our duty in allowing such thoughts to become generally possessed by the people of the country. If we have properly performed our work, then we have at least not properly sold its merits to the people. The abuse of men in public office will not save us. We must exercise our patience and intelligence as trustees to sell the public the truth of our story, if it is true, and if it is not true then we, as individuals and as stockholders, have no right to survive.

The Test of Public Service

I have been asked to speak this evening briefly upon the comparison between government and private operation of electric utility service. I do so with the utmost good feeling toward the advocates of government operation. The most ambitious of these government projects is that of the Tennessee Valley Authority. I assume you are interested in this operation and its merits as compared with private operation. The three members of that Authority, the two Drs. Morgan and Mr. Lilienthal, are men of intelligence, energy and devotion to the work which they have undertaken. I think they are in error, but I do not think it either wisdom or part of my job to belabor them with personal abuse or criticism. However, I do interpret it as my duty to present facts to you and people like you, which I believe demonstrate that private operation is the best, not for me as an executive of a corporation in order that I may draw my salary or that our stockholders may receive dividends, but because it will best serve the public and at the lowest cost. That is the test by which privately owned utility operation as well as publicly owned operation must be measured, and if I evade that test for the interest which I serve I shall fail, and I should fail. You have heard and read much of the low rates which have been promulgated by the TVA. It is my contention that the rates of private utilities in the same area, taking into account the same factors, are lower than the TVA rates, and that is what I wish to demonstrate to you this evening.

One of the companies in the Tennessee Valley in which I am interested is the Tennessee Electric Power Company. (I use this company only illustratively, for what I have to say regarding it can likewise be said of almost any well managed utility.) It has physical assets devoted to the generation, transmission and distribution of electric energy of approximately $100,000,000, which is roughly divided into $45,000,000 in generating plants and $55,000,000 in transmission and distribution lines.

The Federal government from the taxpayers' money, as you know, has given and offered to give 30 per cent of the cost of transmission and distribution systems to municipalities desiring to transmit and distribute electric energy; such municipalities under the TVA Act may purchase at the bus bar their requirements of power from the TVA generating plants. As I said, the Tennessee Electric Power Company has $55,000,000 invested in its transmission and distribution system, 30 per cent of which is $16,500,000. I say that under the New Deal, the "Old Deal" or any "Deal" which is a square deal, in determining the comparative justness of charges for electric energy by a privately owned public utility and those of this government-owned operation, this factor of 30 per cent gift should be taken into account.

The Muscle Shoals hydro plant (built in a low cost period from 1918 to 1925) and steam plant cost the Federal government $60,000,000, all taxpayers' money. I know the members of the TVA consider these plants valuable, because despite a large existing surplus they are building other dams and plants, with the taxpayers' money, in the same general location and I know these plants are worth $60,000,000 to the Federal government because the Alabama Power Company offered to pay, for their power output, $2,400,000 annually or 4 per cent on the $60,000,000 invested. Dr. Morgan, chairman of the TVA, is an eminent engineer and he well knows and has repeatedly stated that hydroelectric plants once built are practically free of depreciation and that their life is almost perpetual. He, however, in his testimony before the House Committee on Appropriations, testified that the TVA proposes to write down these Muscle Shoals power plants on the TVA books from $60,000,000 to $20,000,000 or 66 2/3 per cent. Now understand I am not quarreling with Dr. Morgan at this time about this write down. As a matter of fact, some undoubtedly admire his cleverness in thus reducing his fixed charges. The United States Supreme Court, however, has said that utilities cannot take any such depreciation and in that court's last pronouncement, in the Illinois Bell Telephone case, scorchingly denounced the taking of excessive depreciation by utilities. I say, however, in all fairness, in making comparative studies of the rates of private utilities with those of the TVA operation, account should be taken of this factor.

What Privately Owned Plants Could Do Under Similar Conditions

The value of the generating plants of the Tennessee Electric Power Company is $45,000,000. Give it a subsidy on this of 66 2/3 per cent, or $30,000,000, which, plus the $16,500,000 gift on its transmission and distribution system, would amount to $46,500,000. With this $46,500,000 the Tennessee Electric Power Company could pay off its preferred stock and a substantial portion of its bonds and could write down its capital and property accounts correspondingly.

The Tennessee Electric Power Company is currently paying taxes at the rate of $2,000,000 per year, or almost 20 per cent of its gross revenue. The law provides that the TVA will ultimately pay, as its sole tax, 5 per cent of the wholesale price of electric energy,

or in other words 5 per cent of approximately 6 mills per kwhr. Municipal distribution systems pay no taxes. The application of the TVA and municipal plant tax rate to the private company would reduce its taxes from $2,000,000 to $200,000 per year.

If the factors which I have mentioned are equalized, the Tennessee Electric Power Company could, on its present volume of business, double its net income and still reduce its industrial rates, without the uncertain surcharge, to 10 per cent below the rates charged by the TVA in its operations and reduce rates for domestic and commercial consumers to 35 per cent below the rates charged by the TVA in that nationally famous yardstick at Tupelo.

Other Unfair Advantages

Over and above the factors which I have mentioned, this governmental agency still has enormous advantages, all paid for by the taxpayers, over private utilities. Do you realize that all who work for it travel on the railroads at a reduced rate? Do you realize that all freight hauled by the railroads for this governmental project is hauled at not to exceed 66 2/3 per cent of the freight rate paid by you or by a private power company, while at the same time the government is using the taxpayers' money to support the railroads in their financial difficulty? Do you realize that every letter or circular or advertising dodger, bill for service, etc., which this governmental agency sends out is franked, while the Postal Department operates at a deficit which is supplied by the taxpayers? In addition, the TVA is financed at low interest rates on the credit of all of the property and earnings of every man, woman and child in this country, for such is the lien of Federal borrowings.

Do not be misled by reckless statements and propaganda. Check the facts —all available from public records. Make your comparisons true and I am sure you will conclude that the American people should permit the private utilities to operate unharrassed under the laws which the people have enacted and on the faith of which millions have invested their money.

The Merchants and the Square Deal; How the Utilities May Benefit

The electric power companies have spent large sums of money in newspaper advertising and popularizing the uses of electric energy in order to make the people electrically minded. They have likewise been willing at all times to sell electrical appliances without profit and upon a narrow margin between the manufacturers' price and the retail price, but have been restrained from doing so in order to permit the independent dealers to make a fair profit on the sale of such appliances. As a matter of fact, one of the most severe criticisms of private utilities has been because merchants have contended that the utilities were not permitting the independent dealer to make a fair profit. This criticism has at times been so severe that anti-merchandising laws have been passed in some States prohibiting utilities from selling appliances.

I think the TVA and EHFA will be very helpful to the utilities as well as themselves in further building domestic electric use. In the six months in which these Federal agencies have been engaged in the financing of electrical appliances they have secured, without the expenditure of a dollar for newspaper advertising, more publicity concerning the use of electrical appliances than the private utilities have been able to obtain, by advertising or otherwise, in the last fifteen years. Likewise, the TVA has the authority and is using the mails without cost for the widespread circularization of advertising portraying the benefits of the use of electrical appliances. They have also been able, with the power and prestige of the Federal administration, to overrule the independent dealer and permit only a modest differential between the wholesale and the retail price of appliances.

These advantages, together with the use of low interest rate Federal funds for the financing of such appliances, ought to make it possible for the distributors of electric energy to take a large number of range, water-heating and house-heating customers from the gas and other competitive fuel companies.

* * *

At the conclusion of his talk Mr. Willkie was asked by one of those present concerning the Tupelo, Mississippi, operation and replied as follows:

Tupelo

Tupelo, Mississippi, a town of some five thousand inhabitants, has been very widely advertised as the place in which TVA rates have been put into effect with a resultant rapid and large increase in the use of electric energy.

A fact in connection with the Tupelo situation which apparently has not been equally emphasized in press releases, is that Tupelo always has been a municipal plant operation. The only change that has occurred recently is that the TVA is supervising without charge the municipality's operation and with Federal funds and tax exemption is selling power wholesale to the municipal plant at a rate about one-half cent per kwhr lower than the municipality could purchase its requirements from the private utility which for years had furnished wholesale energy to the city and its industrial consumers. Consequently, Tupelo, assuming it is now making money, leaving out the supervision expense donated by TVA, could have prior to the TVA entrance into the situation had a domestic rate with a top step of four cents and a low step of one cent per kwhr—which all utility men know is low enough to build any domestic use that can be built with the TVA domestic rate which is only slightly lower.

However, until five months ago, the rate charged by Tupelo of its domestic consumers was from once and a half to twice as high as the rates charged by privately operated public utility companies in the same area. Likewise, the municipality has done nothing to build up the business or promote efficiency of operation, with the result that at the time the TVA took over the contract for the sale of wholesale power to the city, the average domestic consumption was less than 400 kwhr per year per domestic consumer. The average use of domestic consumers in cities in the same area which were furnished electric energy directly by private companies, was 800 kwhr per year. Thus the TVA has rendered a real service in the Tupelo situation in again showing what utility men have always contended, namely, that municipal operation does not function effectively or efficiently.

Nothing New in the Tupelo Transformation

In the last several years privately operated power companies have taken over several thousand municipal operations and in practically all cases have greatly and immediately increased the average domestic use of electric energy.

It is stated that the Tupelo increase has been 88 per cent in the months since TVA began selling power wholesale and supervising the city's operation. In several instances the operating units of The Commonwealth & Southern Corporation have taken over municipal operations in the same area and have shown a much more rapid and precipitate increase in domestic consumption. For instance, the Georgia Power Company took over several municipal plants, which, in a very brief period of time showed the following percentage of increase in the domestic use of electric energy:

	Per Cent Increase
Madison, Ga.	414
Waynesboro, Ga.	305
Canton, Ga.	277
Winder, Ga.	352

In other words, the TVA by supervising and subsidizing the Tupelo operation has only done less effectively what private power companies have done manifold times. We did not even consider these accomplishments significant until of late when we read so much about Tupelo.

Every utility man knows the simplicity of increasing domestic load from 300 kwhr to 600 or 800 kwhr per year. The real test comes in competitive fuel areas in building beyond this point, because in order to do so it is necessary to come into substantial competition with gas and other fuels.

Byllesby Prize Paper

HOW TO INCREASE THE USEFULNESS OF THE ACCOUNTANT IN THE PUBLIC UTILITY INDUSTRY

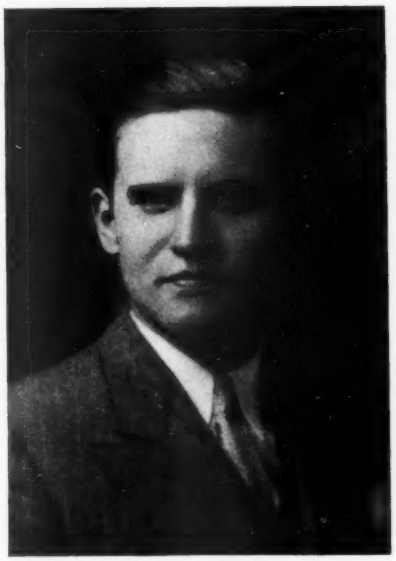
By A. J. KIEFFER

The encyclopedic definition of the word "accountant," which is quoted often, states that "the proper and, in the United States, the only business of an accountant is to examine accounts and prepare balance sheets and other statements." Such a definition was applicable no doubt a great many years ago, but now, and for some time past, the accountant's duties are far more than those of examining transactions and compiling statements.

Formerly, in many instances, the accounting department of an organization was regarded as a "necessary evil," and one that was unproductive. This opinion still exists to some extent, unfortunately, in a few organizations; and it can be traced in almost every instance to one of two causes: First, the accountant may not have increased his usefulness to the extent that present-day opportunities offer; or if he has taken advantage of the many opportunities, he has not made the fact known. Second, the accounting profession has progressed very rapidly in the last ten or twenty years, and as a result much of the criticism directed at it is due to a lack of understanding of the sincerity and honest intentions of the accountants in performing the new duties assigned them.

Drawing conclusions from this, we find that the accountant can increase his usefulness not only in the public utility industry but in all industry by remedying these two factors. The first can be remedied, of course, by the accountant himself; that is, by his keeping pace with his profession; by his keeping his point of view beyond the mere gathering or checking of figures; and by his having a sound understanding of the principles of economics, of finance, and of organization, which are the three fundamental factors underlying any successful business. After the accountant has taken advantage of his opportunities, and is ready to enter upon the seriousness of his profession, he must "sell himself" to the various departments, and to the management of his company.

The remedy for the second factor is not obtained so readily, as considerable diplomacy and work is required to convince determined critics that the accountant is useful and productive, and that the great strides made by the accounting profession will be beneficial not only to the accountants, but to every department in the industry.



A. J. KIEFFER

Mr. Kieffer is the winner of the Second Byllesby Award for 1934. Mr. Kieffer was born in Bowling Green, Ky., in 1904. He attended a Parochial School in that city and was graduated from the Jasper High School, Jasper, Ind., and from Bowling Green Business University. After leaving the University in 1924 he worked for several small companies and in 1926 was employed by the Louisville Gas and Electric Company as a clerk in the Accounting Department. He is now employed as Assistant General Records Accountant.

The accountant in the public utility industry today has unlimited opportunities to increase his usefulness. Present-day agitation over rates and municipal ownership demand that he take advantage of every opportunity and that he do all in his power to counteract criticisms, which are for the most part unjustified, being based on lack of authentic information.

The functions of the accountant through which he can increase his usefulness can be divided, mainly, as follows:

1. Operative
2. Interpretive
3. Constructive
4. Special

1. OPERATIVE FUNCTION

The operative function is a very important one, for on it hinges the success of the other three. Although it requires a great deal of the accountant's time, he should have his department so well organized that the major portion of his time can be spent on the other functions where important results can be accomplished. The operative function covers the maintaining of all records; this includes the control of subsidiary records and internal checks, in order to safeguard the assets of the company as far as it is possible for the accountant to do. Clean-cut accounting methods should be applied to receivables, payables, inventories, costs, and property records.

Having available reliable costs is necessary to successful management, and they should be the foundation for establishing all policies and all controls. The accountant must be able to substantiate his costs, justify his allocations and spreads, and be able to defend his results under any circumstances. Particularly at this time of Federal investigations, State or City Commission investigations and rate suits, the accuracy of company records is of the utmost importance. If no flaws are to be found in the accounting structure, the utility companies start off with a decided advantage in any of these investigations or legal entanglements.

The accountant can do much to eliminate any criticism or trouble in the question of distribution by following as nearly as possible the uniform classification of accounts, and in all cases the Commission's classification of accounts. Particularly in investigations or rate litigations, as outlined above, this is an extremely important factor. Much can be done to help the industry in the public opinion by eliminating criticism on this score, for if inconsistencies are found in distribution,

the accuracy of the entire accounting records would be seriously doubted and contested. It is imperative that the accounting department make thorough checks upon the distribution of materials or labor as determined by the workman. Often the workman is inclined to disregard the importance of accurate distribution by charging items to accounts which will make the best showing for his department. The discontinuance of this practice, if it exists, must be insisted upon by the accountant.

The accountant in the public utility industry can accomplish much by simplifying his records so that anyone, even one unfamiliar with the industry or with accounting, can readily understand them. He should at all times be on the lookout for new methods or systems whereby the preparation of reports can be accelerated, so that they can be furnished the management in the shortest time possible. To accomplish this, the other departments must co-operate fully with the accounting department, for the accounting department's work depends to a great extent upon the speed and accuracy with which information is furnished it.

The executives of the public utilities are looking to the accountants for the answers to new problems and new conditions with which they are contending. Experience of the past few years has taught them that to plan ahead, and make decisions safely, they must have all the facts about the business all the time. These facts can only come from the accountant's records, and the accountant must have these facts available if he is to be of the most benefit to his company.

We can readily see that it is up to our accountants to take inventory of their systems and to see that the records are clear, accurate, and ready for any test. The accountant must ignore no opportunity to improve the working methods of his own department. The method of internal checks should be scrutinized closely at all times, and any weakness should be eliminated. If necessary, recommendations for any improvements in this all-important item should be made to the management.

2. INTERPRETIVE FUNCTION

After the accountant has convinced himself that his own "house" is in order, it is up to him to interpret the results obtained by the operation of his department. We shall call this the "Interpretive Function." The accountant in the public utility industry should realize that he is to the management what the official interpreter is to a foreign minister. The management, in many instances, is as unfamiliar with the accounting practices and accounting statements as are these ministers with the languages of foreign countries. It is the problem of the accountant to interpret the facts, as shown by his accounting statements, in such a manner that there can be no chance of any misunderstanding which might lead to unwise or unprofitable practices or decisions by the management. Many accountants fail in this duty by not spending the time, effort, or thought necessary to interpret their statements or to make them as clear and concise as possible so that executives may understand clearly the results obtained. Information or data must be submitted to the management in clearly defined, pre-digested form.

Accountants in the past have judged, perhaps rightly, that the measure of their capabilities was the volume of their output of reported figures; but now they realize that this cannot be done, as with the laborer, and that their capabilities are measured by the wisdom with which they select the figures which will aid management, and by the accuracy and helpfulness of the conclusions drawn from those figures. Accountants should furnish executives with reports that contain news; reports should not merely confirm what the executive already knows, but should give him vital information. The accountant should arrange and select figures in such a manner as to help the executive see their importance and their meaning. Often by preparing supplementary analyses, the accountant can direct the attention of the management to important characteristics of the business.

The accountant in the public utility industry, as well as in all industry, must be able to interpret and use the information secured by his operations to the best advantage. As a result, he will be indispensable in all departments as an advisor who is ever planning and looking forward to better results than the departments previously have obtained.

3. CONSTRUCTIVE FUNCTION

We have previously considered how the accountant can increase his usefulness in the preparation and interpretation of accurate and essential information. After he has performed these duties, he should be in a position to form constructive plans for his own department, and to offer constructive plans and procedure for the management and for other departments of his company. Policies should be formulated on the basis of facts furnished by the accountant rather than on the basis of opinions hazarded by various individuals. The accountant, today, stands right at the throttle of business. He is in touch with every activity of the industry, and as a result should be able to form sound judgments and to trace the causes and effects of business movements.

The accountant in the public utility should go into every department, planning, advising, projecting results, and coordinating effort by furnishing figures and supplying information. He should not assume the role of dictator, but rather that of an advisor.

The accountant should aspire to the acquisition of a field of business vision which is almost broader than that held by management itself. The possibilities in this direction have been indicated in the past in matters of financing, operating policies, new construction, etc. It is by bringing to bear upon the problems of the industry a balanced point of view and by assisting management in matters of business analyses that the accountant will have his greatest opportunity for service.

Formerly, it was the accountant's duty to watch the rear and see where the industry had gone; but now it is his duty to watch ahead and see where the industry is headed. In increasing measure, executives are looking to the accountant for constructive and interpretive advice and recommendations regarding company activities. The accountant should be able to tell the management what are the dangers in the various courses, so that the management may have this knowledge available for guidance along the safest, surest, and most direct route to the operation of a successful business enterprise.

This is no time for timidity, and the accountant must have courage in his work, and enough temerity to put across his ideas to the executive. He must, however, be unusually tactful in submitting suggested plans lest management get the impression that he is "trying to run the business."

In order to gain the confidence of the management, and to have that confidence firmly established, the accountant must "sell" his ideas so that they will be tried, and each trial must furnish complete justification for his stand. He should follow the trial through to see that prejudicial conditions do not defeat it; and in his report on its success, he must give mathematical proof.

When positive as to the value of his recommendation, the accountant should not accept defeat if turned down; but rather he should work harder than before to make the executive see its value. This is equally true when his plan

proves unsuccessful, and he should work hard to readjust it and make it successful. Success is never found in accepting defeat.

4. SPECIAL

The special functions of the accountant in the public utility industry can be sub-divided into the following:

(a) Budgets
(b) Taxes
(c) Commission Reports
(d) Codes
(e) Financing
(f) Public Relations

(a) Budgets

Budgets may be defined as "carefully detailed plans covering all phases of the operation of a company, together with a definite method of controlling those plans." The control is just as important as the plan.

Budgeting is really accounting reversed, and while budgeting never can be as accurate as accounting, the accuracy of many budgets is almost unbelievable.

It is generally agreed that the predetermining of appropriate expenditures for a business is a function of the management, yet experience has proved that budgets should be checked specifically against previous experiences. Each department should prepare its part of the budget, and these estimates should be scrutinized by the accountant and checked to see that the budget represents a definite and yet apparently attainable improvement over past years

The Construction Budget should be checked thoroughly by the accountant, and he should make a recommendation on each proposed investment as to its potential earning power or whatever factor is the basis for considering the addition or improvement.

The Operating Budget likewise requires serious consideration by the accountant, as, after the estimates for the various departments have been assembled, certain checks must be made against past experiences. The operating ratios of the various departments must be scrutinized closely lest the expenses increase out of proportion to the estimated earnings.

After the Construction and Operating Budgets have been approved, it is then the responsibility of the accountant to supervise the preparation of the Financial Budget. The Construction and Operating Budgets after being converted to a cash basis and after taking into consideration the variation in stock accounts will give a complete picture of the cash receipts and disbursements of the company. It is absolutely necessary for a company to know its cash position, for the treasurer relies on it and bases his plans for future financing. If sufficient funds are not available and if it is not practical to issue new securities, it is necessary sometimes to revise the Construction Budget so that the cash requirements will not exceed the funds available. Especially at this time, when financing is so difficult even for the soundest companies, under the Securities Act it is necessary to know well in advance the funds necessary to be raised. It is also essential that the treasurer should know exactly when the company will have surplus funds and for what length of time those funds will be available for investment.

After the completion of these three budgets, the accountant's assignment has just begun for it is his duty (and the accountant can increase his usefulness to great heights by performing this duty well) to set up an efficient budget control system. It is only by comparison with actual figures that we test the accuracy of the budgets or learn of the necessity of a revision. If actual earnings do not come up to the earnings as estimated, it is necessary in a great many cases for the accountant to recommend the abandonment of certain projects as proposed in the Construction Budget for it may not be practical to make costly improvements or extensions when earnings do not come up to the expectations which were the basis of the original budget. If departmental expenses exceed the budget, thereby increasing the operating ratio as forecast, it is the accountant's duty to secure explanations for such increases; and if the causes are not corrected, the accountant should call the attention of the management to the condition existing so that some remedy may be effected.

(b) Taxes

Since taxes are now one of the most important items of expense in the public utility industry, the accountant should be thoroughly familiar with all new tax legislation being advocated. This is essential so that he may be in a position to advise the management of the effect of such proposed taxes. After the legislation has been passed, it will be too late to consider the industry's stand, and it is necessary that the accountant ever be alert on this score so as to have already prepared for the management accurate figures to furnish the state or federal committees on taxation.

The accountant can prove himself most valuable in the preparation of tax returns. He should take every precaution so that in the returns all items are covered and correct figures are shown. In order to do this, he must be familiar with all tax laws. It is much better for the accountant to spend added time on this phase of the work than for the company to pay heavy penalties for inaccurate or incomplete returns. He must be able to defend his reports for at times taxing authorities endeavor to find flaws when there are none, with the hope of collecting back taxes and large fees.

(c) Commission Reports

The accountant in the public utility industry can increase his usefulness materially in his dealings with the various commissions. Besides being able to give accurate data, he must be able to explain all pertinent facts satisfactorily to the commission. In this way, he will convince such bodies that the accounting systems and records are of the highest caliber and that their accuracy and honesty can be relied upon.

(d) Codes

The accountants of the public utility industry can be of much service to the industry as well as to the Government by assisting in the preparation or revision of Codes by the National Recovery Administration. After these Codes are put into effect the accountant must see that they are followed. He must be thoroughly familiar with their provisions in order to carry out this assignment, which is no easy one. The utilities want to cooperate in this work, and all of their employees should work to that end. The accountant's duty is to see that this is done, as frequently individuals become careless in following set routines.

The accountant, of course, must supervise and approve the preparation of all information furnished in connection with the workings of the Codes, and this information must be reliable.

(e) Financing

The public utility like other industries is now entering a new era of operation. The matter of financing is of the greatest importance and it is one branch in which the accountant can be of the greatest help. He has a large part in the consummation of any financing, and banks and the public will be influenced greatly by accurate accounting records which stand the test of the rigid laws now in existence under the new Federal Securities Act. This Act imposes severe civil liabilities and penalties on any one who sells a security

by means of a prospectus which contains an untrue statement of a material fact; or which omits to state a material fact necessary to make the statement made not misleading; or which does not include all the information required by law.

(f) Public Relations

The accountant in the public utility industry can do much to improve the industry's public relations. The personnel of his department comes in direct contact with the customers, either in the extensions of credit, meter reading, billing, or collecting. The accountant should have his department well trained in the matter of courtesy, and he should impress upon them the fact that they are employees of a public servant.

The accountant can do much to combat municipal ownership by having figures available for comparison with those of municipal plants. The accountants know that the public is in a better position with utilities operated by private interests after taking into consideration taxes and other items to make the two comparable, but this is not enough; the public must be convinced. The accountant and his assistants should be thoroughly versed on this subject, and should be able to talk intelligently on every phase of the subject.

We now have reviewed several functions by which the accountant may increase his usefulness in the public utility industry. It can be seen readily that if the accountant exercises a marked degree of initiative, originality, constructive thinking, and analytical ability, he is given the opportunity to be a leader.

The causes of many failures can be attributed to the fact that business has lived in the past, resented the present, and feared the future. The accountant probably has been as guilty of this as have the executives themselves, and every precaution should be taken to guard against and to correct this condition.

Last, but not least, the accountant must be human. He should treat his subordinates as he would his superiors and associates; if so, he will note the marked improvement in the co-operation given him. A smile and a cherry "good-day" can do much to correct many ills and make the sun shine where there were clouds before.

The accountant now has his assignment—he is prepared and ready to take his place along with other professionals in the administration of business in the public utility industry. The next step falls on the shoulders of the management and the other departments. If the accountant's work is not recognized, or is not used to the fullest extent, his work is in vain. Management must co-operate with and encourage the accountant, and thereby profit by the progress he has made. Then, and only then, the usefulness of the accountant in the public utility industry has been increased to its fullest extent.

ELECTRIC REFRIGERATOR SALES

HOUSEHOLD MODELS ONLY—EIGHT MONTHS 1934

	YEAR'S QUOTA	EIGHT MONTHS' QUOTA 81%	ESTIMATED TOTAL SALES	% QUOTA REALIZATION
New England Division				
Connecticut	19,243	15,587	16,485	105.8
Maine	7,899	6,398	6,155	96.2
Massachusetts	49,224	39,871	46,053	115.5
New Hampshire	5,095	4,127	4,202	101.8
Rhode Island	8,074	6,540	6,938	106.1
Vermont	3,305	2,677	2,449	91.9
Eastern Division				
Delaware	2,054	1,664	2,773	166.6
Maryland & D. C.	20,319	16,458	34,517	209.7
New Jersey	49,202	39,854	52,069	130.6
New York	154,788	125,378	156,513	124.8
Pennsylvania	86,678	70,209	110,140	156.9
East Central Division				
Kentucky	11,293	9,147	18,202	199.0
Ohio	64,710	52,416	82,176	156.8
West Virginia	7,970	6,456	17,004	263.4
Middle West Division				
Iowa	19,012	15,400	19,206	124.7
Kansas	14,127	11,443	19,276	168.5
Missouri	27,824	22,538	47,896	212.5
Nebraska	9,783	7,924	13,789	174.0
Pacific Coast Division				
Arizona	2,916	2,362	3,311	140.2
California	78,695	63,744	58,133	91.2
Nevada	714	578	1,102	190.7
North West Division				
Idaho	3,303	2,675	4,036	150.9
Montana	3,550	2,876	4,865	169.2
Oregon	10,010	8,108	14,383	177.4
Utah	4,863	3,939	5,566	141.3
Washington	18,025	14,600	17,163	117.6
South Eastern Division				
Alabama	7,187	5,821	15,764	270.1
Florida	9,790	7,930	11,829	149.2
Georgia	8,309	6,730	27,853	413.9
North Carolina	10,945	8,865	19,425	219.1
South Carolina	4,358	3,530	9,010	255.2
Tennessee	9,783	7,924	25,669	323.9
Virginia	11,031	8,935	20,105	225.0
Great Lakes Division				
Illinois	77,150	62,492	86,881	139.0
Indiana	28,271	22,900	31,628	138.1
Michigan	44,387	35,953	46,678	129.8
Wisconsin	26,180	21,206	19,461	91.8
North Central Division				
Minnesota	19,794	16,033	16,031	100.0
North Dakota	2,511	2,034	2,943	144.7
South Dakota	3,217	2,606	3,864	148.3
Rocky Mountain Division				
Colorado	8,420	6,820	9,890	145.0
New Mexico	1,388	1,124	2,336	207.8
Wyoming	1,311	1,062	2,088	196.6
Southwestern Division				
Arkansas	4,554	3,689	8,412	228.0
Louisiana	8,242	6,676	8,952	134.1
Mississippi	3,568	2,890	4,827	167.0
Oklahoma	10,531	8,530	16,939	198.6
Texas	26,903	21,791	48,628	223.2
Total	1,010,506	818,510	1,203,615	147.0

INCANDESCENT LAMP STATISTICS, 1933*

The total number of large incandescent lamps sold in this country in 1933 was 1.4 per cent greater than in the year preceding. The number of miniature lamps sold showed a corresponding increase of 26.8 per cent. Almost half of the increase in the number of miniature lamps is accounted for by a very large increase in the number of toy-lighting lamps, which were heavily imported in 1933. The number of automobile headlight lamps sold increased 6 per cent, flashlights 22 per cent, and Christmas tree lamps, 17.6 per cent.

The overall figures of number of lamps sold for each of the past three years are shown in Tables I and II.

Information relating to the distribution of large tungsten filament lamps by size and by voltage (or by ampere rating) is available for Mazda lamps and for Type D lamps shipped during the year by the makers of Mazda lamps, and Tables III to IX relate thereto, the information again covering 1933 with the two preceding years for comparison. In general, lamp stocks are maintained at a fairly uniform level, so that the distribution of shipments for a year will represent fairly well the distribution of lamps sold during the period.

Table III shows the average lumens, watts, and efficiency (lumens-per-watt) of the large lamps referred to in the preceding paragraph. While these figures represent the averages of lamps shipped, consideration must now be given to the fact that fairly large quantities of the lamps included in the analysis have been designed for lives materially different from those applying to the types previously supplied. For example, 21 per cent of the number of large lamps represented in the averages in Table III were Type D; which have design lives as follows, 7½ watt, 1400 hours; 15 watt, 750 hours; 30 watt and 60 watt, 500 hours. Suppose a customer purchases two 30 watt Type D lamps and one 60 watt Mazda lamp, the average wattage of the three lamps as purchased is 40 (that is, 120 divided by 3). However, the two 30 watt lamps would keep only one socket filled for 1000 hours (each lamp living 500 hours), but the one 60 watt Mazda lamp would fill a socket for 1000 hours, as a normal average. The average wattage per lamp *in use* by this customer would, therefore, be 45 [one-half of (30 plus 60)].

If the lamp sales are weighted according to the rated hours' life, the average wattage in use per socket is found to be 58.2 in place of 57.4 as shown in Table III for the average wattage of lamps shipped. In the past this factor (rated life) played a relatively minor role in comparing figures year by year. Now, however, with the introduction of the Type D lamps, and with other

(*Continued on page* 352)

TABLE I—NUMBER OF LARGE LAMPS SOLD

	1933	*1932*	*1931*
Tungsten Filament	338,620,000	334,000,000	344,000,000
Carbon Filament	780,000	800,000	2,500,000
Total Large	339,400,000	334,800,000	346,500,000

TABLE II—NUMBER OF MINIATURE LAMPS SOLD

	1933	*1932*	*1931*
Tungsten Filament	277,900,000	218,900,000	217,700,000
Carbon Filament	260,000	350,000	1,160,000
Total Miniature	278,160,000	219,250,000	218,860,000

TABLE III—AVERAGE INITIAL LUMENS, WATTS AND EFFICIENCY

	1933	*1932*	*1931*
Average Lumens	777	804	817
Average Watts	57.4	59.0	60.9
Ave. Lumens per Watt	13.5	13.6	13.4

TABLE IV—DISTRIBUTION OF LAMPS SHIPPED BY VOLTAGE GROUP

Group	*1933*	*1932*	*1931*
115 V.	92.6%	91.9%	91.5%
230 V.	1.7	1.7	2.1
Street Series	1.8	2.1	1.9
Street Railway	1.1	1.2	1.4
30 and 60 V.	1.4	1.7	1.7
*Miscellaneous	1.4	1.4	1.6
Total	100.0%	100.0%	100.0%

*Includes Photoflash.

TABLE V—DISTRIBUTION OF LAMPS SHIPPED BY VOLTAGE WITHIN THE 100-130 V. RANGE

Volts	*1933*	*1932*	*1931*
110	2.3%	3.0%	3.7%
115	45.2	46.2	48.0
120	47.6	46.0	43.9
125	3.8	3.7	3.3
130	1.1	1.1	1.1
Total	100.0%	100.0%	100.0%
Aggregate 110, 115, and 120 V.	95.1%	95.2%	95.6%

TABLE VI—DISTRIBUTION OF LAMPS SHIPPED BY SIZE

Size	*1933*	*1932*	*1931*
7½ W.	1.2%	0.4%	..
10	2.7	3.0	3.7%
15	7.9	7.4	5.7
25	16.9	18.4	22.1
30	8.6	6.7	2.4
40	10.3	10.9	12.4
50	8.9	9.9	11.7
60	22.2	20.9	16.9
75	3.7	3.0	3.3
100	7.7	8.5	9.4
150	2.5	2.8	2.9
200	2.7	3.1	3.4
250	0.1	0.1	0.1
300-1500	1.0	1.1	1.2
Street Railway	1.1	1.3	1.5
Street Series	1.3	1.5	1.6
*Miscellaneous	1.2	1.0	1.7
Total	100.0%	100.0%	100.0%

*Includes Photoflash lamps

TABLE VII—DISTRIBUTION OF TOTAL WATTAGE SOLD BY SIZE

Size	*1933*	*1932*	*1931*
7½ Watts	0.2%	0.1%	..
10	0.5	0.5	0.7%
15	2.2	2.0	1.5
25	7.8	8.3	9.8
30	4.7	3.6	1.3
40	7.6	7.8	8.8
50	8.2	9.0	10.4
60	24.6	22.6	17.9
75	5.1	4.1	4.4
100	14.3	15.3	16.7
150	7.0	7.6	7.6
200	10.0	11.0	11.9
250	0.4	0.4	0.5
300	3.8	3.9	4.1
*360	0.0	0.1	0.1
**400	0.1	0.1	0.1
500	1.9 } 7.4	2.0 } 7.7	2.4 } 8.5
750	0.4	0.3	0.4
1000	1.0	1.0	1.1
1500	0.2	0.3	0.3
Total	100.0%	100.0%	100.0%

*Sunlight (S-1) Lamp.
**Projection Lamp.

TABLE VIII—DISTRIBUTION OF SHIPMENTS OF REGULARLY LISTED STREET SERIES LAMPS BY SIZE

Lumens	*1933*	*1932*	*1931*
1,000	43.8%	45.5%	43.8%
2,500	26.1	24.0	24.4
4,000	14.4	13.3	14.4
6,000	12.5	13.5	12.5
10,000	2.8	3.0	2.9
Miscellaneous	0.4	0.7	2.0
Total	100.0%	100.0%	100.0%

TABLE IX—DISTRIBUTION OF STREET SERIES LAMPS SHIPPED BY AMPERE RATING

	1933	*1932*	*1931*
4.0 Ampere	3.7%	0.9%	1.5%
5.5	1.3	1.2	1.4
6.6	71.2	72.7	72.2
7.5	7.6	9.4	8.7
Compensator	16.0	15.6	16.0
Miscellaneous	0.2	0.2	0.2
Total	100.0%	100.0%	100.0%

*Based on data compiled by Statistical Dept., Incandescent Lamp Dept. of General Electric Co., Nela Park, Cleveland, Ohio.

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RULES AND CONDITIONS OF CONTESTS FOR PRIZES TO INDIVIDUALS

Any person employed by a company having membership in the Edison Electric Institute is eligible to enter the competition. No [illegible] authors, prepared exclusively for this competition. Papers may be of any length, and pen-and-ink drawings or photographs suitable for reproduction may be included. Papers should be typewritten on one

Papers will not be returned to contestants, but will become the property of the Edison Electric Institute. The first page of the manuscript must give the following information: the name of the prize for which the paper is submitted, title of paper, name of author, name and address of employing company, title or character of position and home address. One paper may not be

Electric Light and Power Industry.

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PAPERS FOR ABOVE PRIZES MUST BE FORWARDED BY MARCH 1, 1935

PRIZES TO COMPANIES AND INDIVIDUALS

For Accomplishments in Specified Activities

CHARLES A. COFFIN AWARD

Sponsored by the General Electric Company

A Gold Medal, known as the Charles A. Coffin Medal, will be awarded to the public utility operating company within the United States which, during the year 1934, has made a distinguished contribution to the development of electric light and power for the convenience and well-being of the public and the benefit of the industry. The company awarded the medal will also receive $1,000 for its employes' benefit or similar fund.

HUGHES AWARD

Domestic Electric Cookery Load

A cup donated by Mr. George A. Hughes, President, Edison General Electric Appliance Company, Inc., to the Company Member of the Edison Electric Institute showing the greatest contribution to the development of the Domestic Electric Cookery Load, through promotion, or selling, or both, during the twelve month period ending February 28, 1935, and cash prizes totaling $1,000 to the individuals responsible for the achievement.

MARTIN AWARD

Rural Electrification

A bronze plaque donated by Mr. Thomas W. Martin, President, Alabama Power Company, to the Company Member of the Edison Electric Institute showing the greatest contribution to the advancement of Rural Electrification (agricultural advancement within the company's territory due to uses of electricity, development of rural load, cooperation with other agencies, extension of rural lines, organization and plan for conducting rural electric development) during the year 1934.

IMPORTANT—Complete details and registration forms for the Charles A. Coffin Award, the George A. Hughes Award, and the Thomas W. Martin Award should be secured from the Secretary, Edison Electric Institute, 420 Lexington Avenue, New York, N. Y.

Elaborate and costly exhibits are unnecessary. The merit of the enterprise presented in papers or exhibits will be the prime factor in determining awards, without regard to the size of competing companies.

PRESENTATIONS OF ACCOMPLISHMENTS MUST BE FORWARDED BY APRIL 1, 1935

Papers and exhibits for 1935 prizes should be addressed to the Secretary, Edison Electric Institute, 420 Lexington Avenue, New York, N. Y. Winners will be announced and prizes awarded at the 1935 Convention of the Edison Electric Institute

PRIZE AWARDS COMMITTEE: Thomas N. McCarter, James E. Davidson, Frank W. Smith, *Chairman*, M. T. Chandler, *Secretary*

NOTES ON THE FINANCES OF THE BRITISH "GRID"

The "Grid" system in England, Scotland and Wales had its origin largely as a result of the difficulties of procurement of electric energy during the World War. Power was supplied by a large number of small and relatively inefficient plants and there was a general lack of facilities for the interchange of power supply. Following a study by a special commission, the necessary enabling legislation was enacted in 1926 and a Central Electricity Board was set up to construct and operate a widespread transmission system which was intended to establish in Great Britain the general plan of "interconnection" already in extensive use in many parts of the United States.* The Board is empowered to select the more efficient generating stations to carry the load, it purchases their output and then resells the energy at wholesale to the different distributing enterprises, or "undertakers," at various points along its transmission system. Although it is perhaps premature to draw conclusions, the results so far reported have occasioned a good deal of interest. It is the purpose of this statement, therefore, to summarize the financial operations of the Central Electricity Board, as set forth in its annual reports.

Functions of the Central Electricity Board

The Act of Parliament which created the Central Electricity Board assigned it two principal duties, (a) the standardization of frequency, the cost of which was to be borne by the electric industry as a whole, and (b) the nation-wide supply of cheap electrical power through the medium of the "Grid," which, after a suitable development period, was expected to become self-supporting through "trading" profits earned from the purchase and sale of electricity. With respect to the first of these operations, the Central Electricity Board has had the following to say:

"Under Section 9 of the Electricity (Supply) Act, 1926, the cost of standardization when required has to be met by the Board, either by repayment of the expense incurred by the authorized undertakers or by advancing the necessary money to them free of interest. The Board may borrow the sums so required and recover from the Electricity Commissioners the interest and sinking fund charges in respect thereof. The Commissioners in turn will recover such sums by a levy on the Electricity Supply Industry as a whole, the total being apportioned amongst all authorized undertakers on the basis of the revenue received from the sale of electricity other than electricity sold in bulk to other authorized undertakers." (First Annual Report of Central Electricity Board, 1928, page 28.)

"The certified returns submitted to the Electricity Commissioners for the year ending 31st December, 1931, showed that the revenue received (as above) by authorized undertakers in Great Britain during that year amounted to £53,661,531, the levy of £333,000 in respect to standardization of frequency thus involving a payment of about 12s 5d for £100 of revenue." (Thirteenth Annual Report of the Electricity Commissioners, 1933, page 121.)

Securities Issued

Table I shows the various "stock"** issued by the Central Electricity Board up to the end of 1933, the prices at which they were sold and the expense of their flotation. Up to Dec. 31, 1933, £12,905,000 face value were issued for the purpose of standardization of frequency and £31,095,000 for the construction of the "Grid" and for other purposes. The earliest issue sold at a large discount. The expenses of flotation have been rather considerable and have averaged 1.7 per cent of face value. Of a total of £44,000,000 face value, the sum of £40,846,376 was realized, or about 93 per cent. The ratio of the total annual interest to total money realized is 4.80 per cent.

In its treatment of debt discount and expense the Board differs from prevailing American practice. Instead of amortization over a period of years, the entire sum is immediately charged out to construction expenditures, along with net interest payments of the year, as will be explained. Table II shows these "construction expenditures" year by year since the organization of the enterprise for both Standardization of Frequency and General Purposes. At the end of December, 1933, the "construction expenditures" for the "Grid" were made up of the items shown in Table III, only 81 per cent of the total representing money actually paid for physical assets.

Nowhere in any of the reports is there any mention of depreciation, and this item is not shown in any of the financial statements. However, the

*For further details, see "Electricity Supply in Great Britain and the United States," E.E.I. BULLETIN, September, 1934.

**Although called "stock," they more nearly correspond to what are known as "debenture bonds" in this country. They are "a first charge on undertaking and net revenues." Moody's Manual rates them at "A". The external and internal loans of the United Kingdom are rated "Aa".

TABLE I—STOCK ISSUED—CENTRAL ELECTRICITY BOARD

	For Standardization of Frequency					For Other Purposes					Total Sold		Total Face Value Outstanding at End of Year
Year	Face Value	Rate	Sales Price	Costs of Issue	Net Realization	Face Value	Rate	Sales Price	Costs of Issue	Net Realization	Face Value	Realization	
1929	£600,000	4%	83	£12,000	£486,000	£2,400,000	4%	83	£47,548	£1,944,452	£3,000,000	£2,430,452	£3,000,000
1930	1,380,000	4½%	95½	24,605	1,293,295	4,620,000	4½%	95½	82,375	4,329,725	6,000,000	5,623,020	.....
1930	2,100,000	5%	97½	37,858	2,009,642	4,900,000	5%	97½	88,336	4,689,164	7,000,000	6,698,806	15,980,417
1931	750,000	5%	93.92	3,438	700,937	2,250,000	5%	93.92	10,314	2,102,811	3,000,000	2,803,748	18,943,091
1932	2,275,000	5%	95	40,077	2,121,173	4,725,000	5%	95	83,236	4,405,514	7,000,000	6,526,687	.....
1932	3,000,000	4½%	96	52,743	2,827,257	7,000,000	4½%	96	123,066	6,596,934	10,000,000	9,424,191	35,806,683
1933	2,800,000	3½%	93½	49,185	2,568,815	5,200,000	3½%	93½	91,343	4,770,657	8,000,000	7,339,472	43,739,548
Total	£12,905,000			£219,906	£12,007,119	£31,095,000			£526,218	£28,839,257	£44,000,000	£40,846,376	
Redeemed	260,452					.....							
Outstanding Dec. 31,1933	£12,644,548					£31,095,000							

Source: Condensation of Annual Reports of the Central Electricity Board.

TABLE II—Capital Expenditure—Central Electricity Board

	Standardization of Frequency	All Other Purposes	Total
To 31st December, 1929	£626,611	£2,288,525	£2,915,136
Year 1930	1,194,774	5,189,222	6,383,996
Year 1931	2,895,341	7,922,346	10,817,687
Year 1932	4,322,896	8,188,071	12,510,967
Year 1933	2,782,904	5,399,756	8,182,660
Vehicles, tools and instruments	.....	34,528	34,528
Total, Dec. 31, 1933	£11,822,526	£29,022,448	£40,844,974

TABLE III—Details of Capital Expenditures—"All Other Purposes"

Construction and acquisition of Main Transmission Lines (a)	£23,647,610
Other expenditures preliminary to construction, office furniture, etc.	157,813
Vehicles, tools and instruments	34,528
Interest on borrowed money	2,807,777
Discount on Stock	1,729,525
Costs of Issue on Stock	526,218
Repayments to Minister of Transport and Electricity Commissioners (b)	118,977
Total	£29,022,448

(Source: Statement 3, page 4, "Central Electricity Board, Statement of Accounts, 1933")

(a) Includes Administration Expenses allocated to construction, less credit balance from "trading" operations.

(b) "Section 26 of the Act also places the Board under obligations to repay to the Electricity Commissioners the expenses incurred by them in the preparation of schemes under the Act and to the Minister of Transport the expenses and liabilities incurred by him before the commencement of the Act preliminary to the preparation of such scheme." (First Annual Report CEB § 14, page 29.)

Commissioners, in giving sanction to the Board to borrow, prescribe the period within which provision must be made for repayment of stock issued. In respect of money borrowed for the purpose of standardization of frequency, the period prescribed is 40 years; in respect of borrowings for other purposes various periods are fixed for the respective classes of expenditure, e. g., freehold land, 60 years; buildings, 30 years; overhead lines, 25 years; underground mains, 40 years; plant and machinery, 20 years.

The provision for repayment of money borrowed for purposes other than standardization of frequency and the discount on issue corresponding therewith may be suspended, with the consent of the Electricity Commissioners after consultation with the Treasury, for a stated period of years unless the expenditure becomes remunerative at an earlier date.

Income and Expenses of the Grid

The Board commenced "general trading" in Central Scotland and Mid-East England on Jan. 1, 1933, this "trading" being defined as the wholesale purchase and sale of electricity. It is confined to dealing, in bulk, with authorized undertakers. The Board does not supply electricity directly to retail consumers.

The output of all the Selected Stations is purchased by the Board, which then resells this energy at the prices normally chargeable at the Grid Tariff for the area. This Grid Tariff is so fixed that, over a term of years to be approved by the Electricity Commissioners, the revenue receipts shall be sufficient to cover the revenue expenditure, including interest and sinking fund charges, with such margins as the Commissioners may allow. To facilitate still further the charging of low prices from the outset, the Board is empowered for limited periods to capitalize interest and to suspend the annual provision for the repayment of money borrowed.

Applied to a growing industry, a tariff of the kind prescribed assumes that, in the earlier years of a budget period, the expenses may exceed the revenues. In later years, however, there should be surpluses sufficient to recoup the earlier deficiencies and leave a margin, the deficiencies meanwhile being met out of working capital. The adopted tariffs contemplate a budget period of ten years, on the assumption that the demand for electricity in Great Britain is potentially so great that this policy of budgeting for losses in the early years of the first tariff period can safely be adopted.

It may be observed that this financial policy fails to take into account the question of compound interest on the losses incurred during the early years. A government is a vast continuing business enterprise and since, in government finance, a penny spent is a penny borrowed, the capitalization of interest means that the Government must borrow somewhere the full equivalent amount from somebody else. Budgeting for early losses and the immediate charge of interest to the capital account will thus, from this point of view, entail the borrowing of more money with which to pay this interest and the inevitable burden upon the government of further interest upon the money so borrowed.

A recapitulation of the Statements of

TABLE IV—Income Statement—Central Scotland and Mid-East England Areas*—1933
(Construction Complete)

Revenues from sale of energy		£3,651,432
Cost of Energy Purchased		3,517,230
		£134,202
Operating Expenses:		
Operation, maintenance and miscellaneous	£71,187	
Local taxes	7,782	
Proportion of management and general expense	48,711	
Total		£127,680
Operating Income		£6,522

Income Statement—All Other Areas
(Construction Incomplete; Accounts Stated to be "Preliminary to General Trading")

Revenues from Sale of Energy		£1,867,262
Cost of Energy Purchased		1,647,947
		£219,315
Operating Expenses:		
Maintenance of lines and stations	£110,653	
Operation, other than maintenance	78,483	
		189,136
Balance, stated to be "treated as a contribution to Administration Expenses and credited to Capital Expenditure"		£30,179

NOTE: *General "trading" commenced in the Central Scotland and Mid-East England areas on January 1st, 1933. The tariff was fixed upon a Budgeting Period of 10 years which was approved by the Electricity Commissioners as that over which the receipts on income account shall be sufficient to cover the expenditures on income account, including interest and sinking fund charges, and leave a margin. The balance resulting from preliminary trading in other areas where work is still under way does not represent operating income, inasmuch as the costs of management and general expense evidently exceed the net amount shown.

(Source: Tables 5, page 6 and 5(a) page 8, "Central Electricity Board, Statement of Accounts—1933.")

Capital Expenditure shows that the total interest on money borrowed for the furtherance of the Grid Schemes (i. e., excluding the expenditures for the Standardization of Frequency—which involve an entirely different philosophy) was £2,807,777 at the end of 1933. If, however, these annual interest payments, charged to capital expenditure, are considered to have necessitated the further raising of funds at the average cost to the government of 4.80%, this interest will stand compounded at £2,942,668 with a charge for the year 1934 of £141,248 for interest on this interest.

The total trading profit in 1933 (i. e., the balance remaining from the proceeds from the sale of energy after the subtraction of expenses arising from the purchase of energy and out-of-pocket expenses of operating the Central Scotland and Mid-East England sections of the grid which comprised about 20% of the total electrical business of the country) was only £6,522 in 1933. It is thus evident that the enterprise is engaged in a steeple-chase with compound interest with the latter at present in the lead.

The commitments already made are of such magnitude and the accumulated deficits are already so pronounced that one may well view with concern the great increase in kilowatthours necessary to ensure ultimate success. Superimposed upon the existing electric supply system of a more mature country, electrically speaking, such as the United States, the recurring deficits of the earlier years would inevitably involve the undertaking in a quicksand of compound interest from which the only escape would be the writing-off of the enterprise at the expense of the general taxpayers of the country.

The financial results of the first year of operation are shown in Table IV. The total operating income for 1933 was £6,522. The Board does not state the investment of "construction expenditures" by areas, but, allocated on the basis of transmission line mileage and other factors, the two areas covered by this statement probably approximate 20 per cent of the grand total.* This, applied to a total of £29,022,448, would indicate an investment of some £5,800,000, the annual interest on which, at 4.8 per cent, would come to £278,400 per annum. This first year of operation is, of course, no criterion of future profits, but it is evident that, to meet interest, depreciation and the eventual repayments of capital, either a large growth in the volume of business must be encountered or else the price of energy sold to the distributing enterprises must be substantially increased.—W. M. C.

*The Board does not give the figure for kilowatthours bought and sold. However, the total generation of electricity by all authorized plants in the two areas is shown for 1933 as 2,496,500,000, or 22.7% of the total of 11,018,000,000 generated. The capacity of the selected stations in these areas is given as 1,191,995 kilowatts or 18.7% of the total capacity of all selected stations. The transmission consists of 563.3 miles of 132,000 volt and 211.2 miles of lower tension lines out of a total of 3,000 miles of 132,000 volt and 1,000 miles of lower voltages.

ROCKY MOUNTAIN ASSOCIATION HOLDS SPECTACULAR CONVENTION

The largest and most spectacular garden-lighting scene ever produced anywhere, with lofty pines and an array of mountain peaks 13,500 feet in height as a background and a near-by glacier providing the running water effects, was viewed in Estes Park, Colorado, when the Rocky Mountain Electrical Association held its annual convention, September 10-13.

The convention also was the first gathering of its kind, of record, held exclusively by study and reading lamp illumination.

Another "first" scored by the association was the re-election of G. B. Buck, Public Service Company of Colorado, as president. He is the first man ever so honored twice in succession by the electrical fraternity of Colorado, New Mexico and Wyoming.

The huge outdoor lighting spectacle, amid towering cliffs, aspen groves and other beauties of the nature-made garden, was the setting for the association's annual trout and steak broil, a few miles from the Stanley Hotel, where the convention was held. Acres of this wild beauty were illuminated with scores of powerful flood and spot lights which served to accentuate the greens, golds, reds and other autumnal colors of trees and foliage.

The association's Lighting Committee, which has met with such signal success in promoting the yard and garden lighting movement in Denver and other localities during the past summer, was responsible for the unique night scene and the novel use of the study lamp. A special line was strung for the occasion.

The use of the study lamp during the convention was part of the association's Better Light - Better Sight program. Every delegate's room was equipped with one of the lamps. Guests arriving at the hotel were registered by the light of two of the units. The lobby, lounge, music room and other parts of the hotel were illuminated with study lamps and every session in the convention hall was held by study lamp light.

If there is a utility man in the Rocky Mountain territory that doesn't know what the new study and reading lamp is —and what it does—he is the fellow who didn't attend what proved to be the largest gathering in the association's history.

More than 1,000 employes of member companies of the association are now engaged in the lighting activity, which includes radio, newspaper, direct mail, billboard and other forms of advertising. Eye specialists, paint men and others are joining the movement.

The association has already drawn a tentative program to run through 1935, as a result of the success of the Sales Rally activity this year.

While merchandising was the dominant theme of the Estes Park convention, scores of other subjects were exhaustively discussed and plans for action laid. E. E. Brazier, General Electric Supply Corporation, Denver, chairman of the Appliance Division, received the association's annual award for notable achievement during the past year—a diamond-studded gold charm.

Golf took up no time of the convention and a system of fines resulted in a minimum of tardiness and absence from meetings.

Those who will carry on with President Buck for the next year are: T. C. Brown, Socorro, New Mexico, Vice-President; K. W. Kissick, Trinidad, Colorado, Vice-President; J. H. Jacobucci, Green River, Wyoming, Vice-President; A. C. Cornell, Denver, Treasurer. George E. Lewis, Denver, was reelected as secretary and managing director.

The executive committee consists of the following: G. B. Buck, W. D. Johnston, Casper, Wyoming; Arthur Prager, Albuquerque, New Mexico; Guy W. Faller, Denver; G. W. Milliken, Pueblo, Colo.; A. H. Heitzler, Denver; J. A. Clay, Durango, Colo.; W. C. Sterne, Denver; J. H. Jacobucci, Green River, Wyo.; K. W. Kissick, Trinidad, Colorado; W. D. Trudgian, Denver; E. E. Brazier, Denver; A. C. Cornell, Denver; H. A. Mitchell, Denver.

COMMERCIAL PROGRAMS GAIN MOMENTUM

H. P. J. Steinmetz Heads Sales Committee

By C. E. GREENWOOD
Commercial Director, Edison Electric Institute

The big news of the month in the commercial activities of the Institute was the appointment by President Thomas N. McCarter of a new Chairman for the Sales Committee—H. P. J. Steinmetz. Mr. Steinmetz was born in Newark, N. J., in 1890 and prepared for college in the public schools of Newark. After completing his education at New York University he entered the employ of Public Service Electric and Gas Company in its general offices in 1907. He continued his upward career in that company, holding various positions in the Auditing and Commercial Departments both in the general office at Newark and as a Field Representative of Camden, N. J.

In 1931, when the ranks of his company were surveyed for a man to head the sales activities of the company, Mr. Steinmetz was chosen for the job and has since served his company as General Sales Manager. He has been active in the dealer cooperative work in towns served by "Public Service" and has been a member of the Sales Committee of the Institute since its formation.

Mr. Steinmetz succeeds the dynamic leader, George E. Whitwell, who was unable to give time to the demands of this important work.

Chairman Steinmetz has called a meeting of the Sales Committee for October 19th at Chicago for organization and outlining Committee programs for the administrative year, and plans continuity of action by all Sub-Committees.

* * *

President McCarter has extended invitations to the following men to serve on the Sales Committee this year:

H. P. J. Steinmetz, Public Service Electric & Gas Co., Newark, N. J., *Chairman.*
P. S. Arkwright, Georgia Power Co., Atlanta, Ga.
J. F. Becker, The New York Edison Co., New York, N. Y.
W. C. Bell, New England Power Ass'n., Boston, Mass.
A. A. Brown, Oklahoma Gas & Electric Co., Oklahoma City, Okla.
R. D. Cutler, The Hartford Electric Light Co., Hartford, Conn.
J. E. Davidson, Nebraska Power Co., Omaha, Nebr.
D. M. DeBard, Stone & Webster Service Corp., New York, N. Y.

H. P. J. STEINMETZ
Newly Appointed Chairman of the Sales Committee

L. L. Edgar, The Edison Electric Illuminating Co., Boston, Mass.
R. E. Fisher, Pacific Gas & Electric Co., San Francisco, Calif.
W. L. Frost, Southern California Edison Co., Ltd., Los Angeles, Calif.
B. H. Gardner, Columbia Engineering Corp., Columbus, Ohio.
W. H. Hodge, Byllesby Engineering & Management Corp., Chicago, Ill.
J. G. Learned, Public Service Company of Northern Illinois, Chicago, Ill.
E. W. Lloyd, Commonwealth Edison Co., Chicago, Ill.
P. E. McChesney, Gulf States Utilities Co., Beaumont, Texas.
C. E. Michel, Union Electric Light & Power Co., St. Louis, Mo.
G. E. Miller, The Cleveland Electric Illuminating Co., Cleveland, Ohio.
J. D. Noyes, The Detroit Edison Co., Detroit, Mich.
P. H. Powers, West Penn Power Co., Pittsburgh, Pa.
F. J. Rutledge, The United Gas Improvement Co., Philadelphia, Pa.
W. H. Sammis, The Commonwealth & Southern Corp., New York, N. Y.
H. M. Sawyer, The American Gas & Electric Co., New York, N. Y.
M. E. Skinner, Niagara Hudson Power Corp., Buffalo, N. Y.
H. F. Smiddy, Electric Bond & Share Co., New York, N. Y.
R. H. Tillman, Consolidated Gas, Electric Light & Power Co., Baltimore, Md.
G. E. Whitwell, Philadelphia Electric Co., Philadelphia, Pa.
H. E. Young, Northern States Power Co., Minneapolis, Minn.

* * *

D. M. DeBard, Stone & Webster Service Corporation, heads the Residential Sales Committee again this year; C. E. Michel, the Air Conditioning Committee; P. H. Powers, the Rural Sales Committee; J. D. Noyes, the Wiring Sales Committee; and W. H. Sammis, the Industrial Power & Heating Committee. The expanded activities of the Better Light-Better Sight Program under M. E. Skinner have prevented Mr. Skinner from serving this year as Chairman of the Lighting Sales Committee. His successor had not been chosen at the time the Bulletin went to press.

* * *

Better Light—Better Sight

Lighting is receiving its greatest stimulus in several years under the banner of Better Light-Better Sight. This Program of education, social service, and commercial contributions, headed by Chairman M. E. Skinner, Assistant Vice President, Niagara Hudson Power Corporation, is now one of wide dimensions, and is known in every State. The prospectus of the National Program, submitted several months ago by the Lighting Sales Committee, laid special emphasis on the value of organizing local cooperation programs among all interests that are, or should be active in the promotion of "better seeing" conditions.

Many utility executives immediately saw the wisdom and advantages to be gained by taking the initiative in correlating all local groups and individuals into local Better Sight Bureaus, or equivalent names, and organizing an educational activity on Better Light for Better Sight. Boards of education, school teachers, parent-teachers associations, charity societies, parochial schools, societies of the blind, community fund industrial commissions, health councils, public health departments, federations of women's clubs, advertising clubs, optical dealers, paint and wallpaper dealers, safety councils, department stores, electrical wholesalers and retailers and electric utilities represent some of the local groups interested in the promotion

and development of Better Vision facilities.

Such groups are already organized and active in the cities of Philadelphia, Cleveland, Fort Worth and Pittsburgh, and many other centers, large and small, have plans under way for the organization of similar cooperative programs.

The force of the combined efforts of such local groups unquestionably will make great progress in the education of the public.

* * *

Home Lighting campaigns appear to be predominant in the great majority of local utility activities this fall. The new Science of Seeing, the simplicity but effectiveness of the "new approach" plan with the light measuring meter, the availability of practicable demonstrating equipment for determining poor lighting and good lighting and the production of the new scientifically designed portable lamps, have opened up new channels and methods of interesting the public in better home lighting equipment and conditions.

G. R. Trumbull, of the Commercial Dept. E. E. I., Manager of the Better Light-Better Sight Bureau, states:

"Scattered reports of local campaigns started in September indicate an unexpectedly quick acceptance by the buying public for these new lamps. One utility reports sales of 1100 study lamps in three weeks with orders now placed with manufacturers totaling 5500 against the original year's quota set up of 1500 lamps.

"Many manufacturers not having anticipated the volume of orders now coming in are way behind in production and utilities and other lamp retailers are clamoring for deliveries.

"Retailers are quite generally taking on this new line of lamps and pushing them energetically where the utilities are aggressively promoting and advertising the lamps with the public. If the meager reports to date are any criterion of the situation generally over the country and sales continue as at the present rate, there are good indications that several hundreds of thousands of lamps will be sold this fall. One astute observer of the portable lamp business has confidentially predicted the sale of 2,000,000 of the new certified lamps this fall and winter."

* * *

Running Water Program

The printers are still getting orders for more Broadsides and more Window Seals to fill orders for continuous additions to the companies who are tying in with the Electric Water Systems Council program headed by P. H. Powers, Vice President, West Penn Power Company. But Mr. Powers and his Committee are still not satisfied with the progress made in this first Concentration Period of the fifteen months' activity to bring running water into the homes of many rural and semi-rural communities.

Readers of the last issue of *Rural Electrification Exchange,* a bi-monthly publication of the Rural Sales Committee, could not fail to be impressed with the effective action being taken by the large list of utility companies outlined in that issue.

There are many other companies that are actively engaged in the promotion of running water in the home which is a real contribution to better living. This is a joint effort with the pump manufacturers and their local dealers and utility to cooperate. Space does not permit a tabulation of these local activities, but the following quotation from a letter from P. M. Alden, Manager, Sales Department, Philadelphia Electric Company, is indicative of the possibilities in this Program:

"One of our first moves in cooperation with the Electric Water Systems Council was to make a comprehensive survey of our territory to determine exactly how many customers connected to our lines do not have running water at the present time. This survey indicated that there are 1700 such potential customers for water pumping systems in our territory and also showed definitely just where these potential customers are located.

"Based on this information as to the available market, we decided that for the first period of our campaign from July 15th to October 1st, 1934, we would set a quota of 90 units which, you will note, is some 33 units in excess of 1/3 of 170. Up to the present time we are pleased to report that we had been instrumental in the sale of 120 installations, with a good chance that this number will be increased to 150 before the end of our campaign activity. In other words, instead of taking 15 months to meet the objective set by the Water Systems Council, it appears that we will be able to come close to meeting this objective in our first three months of the campaign. Consequently, future campaign activities should make it possible for us to materially exceed our quota within the 15-month period."

* * *

Electric Table Cookery

"Electric Table Service Saves" has been demonstrated in hundreds of homes that have been approached through stimulation given in the National Table Cookery Program headed by Chairman D. M. DeBard. Readers will recall that this Program is operating in conjunction with the Domestic Appliance Section of the National Electrical Manufacturers Association. A monthly reminder of the activity and progress being made—*Table Cookery Topics*—has been distributed to utilities, and there has been wide distribution through manufacturers and utilities to dealers of all classes in electric tableware.

Table Cookery Topics will be published until the first of the year, and there is an urge from both manufacturers and utilities to broaden this Program for 1935. The subject will be taken under advisement at meetings of the Domestic Appliance Section of N.E.M.A., and at the meeting of the Sales Committee later in October. With the momentum gained over the past six to eight months through local promotion of electric tableware that for the past few years has been more or less neglected, highly effective results could be expected during the coming year. Statistics on sales of appliances for 1934 will show gratifying increases in volume of sales of many of these smaller but serviceable cooking devices for the home.

* * *

Refrigerator Sales Records

There has been some discussion in one of the trade journals about the accuracy of reports on the volume of refrigerator sales. Inference was made that the estimates of the Edison Institute were high.

It is impossible to get the exact figures from any source for retail sales. Figures on manufacturer output may not be exactly accurate for any one month but they even up over a short period of time.

The statistical records of E.E.I. were compiled in conjunction with the Refrigeration Division of N.E.M.A., on a basis agreed upon by this manufacturers' group, and their accuracy cannot be challenged any more than the output figures from any other reliable source.

The trade magazine that raised the point at issue states in connection with the estimate of total sales of refrigerators for 1934, "It does seem an eventuality that the figure will be so far in excess of anything the industry has done previously that it may be a mark to shoot at for a long time to come."

This is the broad objective in which we are vitally interested. The details of method of arriving at monthly sales is of far lesser importance.

GROUNDING AND ELECTRICAL WIRING SYSTEMS

By ALEXANDER MAXWELL
Director of Engineering, Edison Electric Institute

Presented at the meeting of the Southern Section, International Association of Electrical Inspectors, New Orleans, La., October 2, 1934

This brief paper is not intended to go very extensively into the technology of grounding. Instead it is meant to look into the state of grounding practices as they actually exist and to consider the influence of these conditions upon the characteristics of wiring systems. The subject is limited in this way intentionally because this is a most practical subject at the present time on account of the rapid extension of house wiring into areas and into types of occupancy that will probably bring out in sharp relief certain grounding problems which, although they may have existed heretofore, have been compromised or ignored without too serious results. Compared with this, a highly technical discussion of some or all of the refinements of grounding would be less important and certainly less timely.

Some space will be devoted to an appraisal of certain limitations of grounding which appear to exist and which should certainly be discussed and appraised if they do exist. A fair appraisal of grounding practices, taking account of deficiencies as well as advantages, will be no disservice to the art; indeed it will be a benefit, for sometimes it has seemed that this useful protective practice most needed to be saved from its friends and more zealous advocates.

The role of grounding applied to interior wiring systems is wholly one of protection. Grounding is not necessary for the mere operation of such systems and ground circuits are neither necessary nor desirable as conductors of working currents as in the cases of telegraphy or tramways. The protection afforded by grounding is solely against the effects that may be produced by extraneous voltages—that is, voltages which appear where they are not expected or do not belong. It provides no protection against normal overloads or against excessive heating due to poor joints or other high-resistance contacts. Historically grounding was first employed for protection against high voltages, either lightning or the voltage of primary circuits that might be imposed due to accidental crosses; the characteristic of this situation is that such high voltages may not be confined by the insulation provided for the normal voltage of the circuits, but grounding tends to hold such voltages down toward earth potential and, by causing excessive currents to flow to ground, to cause the operation of series fuses and thereby clear the interior conductors of the extraneous voltage. Later, and particularly in connection with the extensive use of wiring systems having metallic envelopes, the same principles for grounding were applied to metallic surfaces that were not normally energized but which might, by mischance, become alive at the ordinary potential of the interior wiring circuits. With respect to this situation grounding was expected to function in the same way as for the higher accidental voltages. Some distinctions have occasionally been made, for special cases under this general situation, between personal and fire hazards, but there appears to be no systematic difference between them because any potential existing where it might cause shock, may also—in theory at least—cause current flow or arcing, and hence fire hazard.

MR. MAXWELL

Obviously for the best effects of grounding when it is brought into play a low resistance connection to the ground is highly desirable, and practically all of the theories about grounding, and the rules for the practice of grounding, contemplate ground circuits of very low resistance. Quantitative rules deal, in general, with the contact resistance between grounding electrodes and earth, but it is equally important and invariably assumed that the parts of the grounding circuit that consist of metallic conductors shall be continuous and of negligible resistance.

It is equally obvious that the importance of low resistance grounds increases as the voltage to be dealt with decreases. Thus a ground circuit of a certain total resistance energized by an extraneous voltage substantially higher than the normal circuit voltage may readily cause sufficient current flow to operate service fuses and clear the fault from the interior wiring. But the same ground circuit might not accomplish this if energized only by the normal interior circuit voltage, or some part of it. It will be understood that a "grounding circuit" is not used here in the conventional code sense, but denotes the entire circuit from the point where it is connected to the thing to be protected, to and including the earth electrode and the body of the earth to the terminal point from which its operative potential is derived.

It is therefore important, if any great reliance is to be placed on grounding as a protective measure, to appraise carefully the possibilities for procuring grounding circuits of adequately low resistance and the prospects for maintaining them in this condition. If some of the physical facts, and some of the probabilities, are not as favorable as might have been hoped, this does not by any means lead to a condemnation of grounding for all protective purposes but only to a definition of the limits beyond which it may not be counted upon for certain purposes.

What then are the facts of the matter? There are two main limitations to the resistance of grounding circuits. The first is that with certain types of available ground electrodes in certain soils, it is physically impossible to procure contact between the grounding circuit and earth of sufficiently low resistance for all of the purposes for which

grounding might be used, and sometimes, in extreme cases, not sufficiently low for any purposes. The second general limitation is that grounding circuits, not being essential for the functioning of the electrical apparatus with which they are associated, are not self-supervisory. That is to say, a lamp will burn or a motor will turn and deliver power, whether or not an auxiliary ground connection is operative.

The first of these general limitations, that of ground electrode resistance substantially, is a question of fact and one concerning which there are ample available data. It may be confidently stated as an accepted fact that there are many situations where satisfactorily low ground resistances cannot be obtained by any reasonable means and sometimes not by any means whatever. There are various subsidiary considerations that arise out of this situation. One of the most important of these, and one directly affecting rural installations where the most desirable types of ground electrodes are not available, is the extreme sensitiveness of domestic animals to fatal shock. Thus local water systems may provide reasonably satisfactory grounding electrodes so far as the house wiring is concerned. But they are not good enough to provide, in the event of a contact, against a moderate rise of potential against the surrounding soil that often has been fatal to cattle although not otherwise a matter of concern. Similarly, even the ground connection that is usually regarded as the most desirable, that to water pipes, may be and sometimes is limited by high resistance joints, by insulating joints, or by changes or alterations in the piping system.

The second general limitation is more difficult to appraise. In addition to the inherent characteristic of being non-automatic, grounding circuits suffer the further disability that they are in the hands of laymen. The most elaborate policing that is reasonable to conceive would still leave grounding circuits for long periods of time subject only to the maintenance of lay users who for the greater part are incapable of understanding the function of grounding and who are moreover interested mainly in the functioning of the apparatus with which they work. Nevertheless there are a good many people desiring to make the benefits of grounding more available, who believe, no doubt sincerely, that these handicaps may be overcome by strict adherence to somewhat formidable construction requirements. That is to say, they evidently feel that it is possible to circumvent the natural results of ignorance, indifference and neglect, by providing in advance, by construction, against their probable effects.

Unfortunately this view is not in accord with the logic of the situation. In the long run—more than that, in the common case—such an auxiliary circuit as a grounding circuit, not essential to what would appear to the layman as the normal functioning of equipment, will inevitably have a tendency to fall into disrepair and disuse. Even with a reasonable amount of expert supervision this would still be the case, with the natural result that the more strained applications of grounding, the over-refinements, as it were, would be the first to suffer. It is not intended to labor this question unduly. It is in part a matter of opinion, but not wholly so, for there is ample evidence in the record to make this natural decadence a matter of common knowledge. The explanation is slightly philosophical and lies in the fact that among all of the mischances that may beset grounding circuits, these, under the stated conditions, will tend to make the grounding circuits worse and not better. For example, it is inconceivable that any accident that might befall a grounding circuit would make it better than it had been before.

To sum up, grounding as a protective measure for interior wiring systems is affected by definite limitations which substantially restrict its universal use under all but the most favorable circumstances but which do not necessarily destroy its utility for some purposes which are still important and useful. These limitations, which are in one way or another involved with the resistance of the total grounding circuit, are inversely proportional to voltage and it may therefore reasonably be stated that although there are many situations where grounding is of little or no utility against the normal voltage of the circuit, it is still good practice to install grounds as protection against extraneous and higher voltages.

This conclusion, if it is a sound one, does not greatly affect the insulated, that is to say, the non-metallic systems of wiring. In the case of such systems this conclusion calls for providing the conventional neutral service ground or of deriving this by means of the neutral conductor from other grounds at other places, as a safeguard against high extraneous voltages. There is a reasonable likelihood that this ground, of the best resistance permitted by the conditions, would be substantially effective for this purpose. Equipment grounds if required for any reason, would not be very efficient with respect to the normal circuit voltage under such conditions.

For the systems of wiring which are enclosed in metal envelopes, however, the case is different. On account of the presence of the metal envelope everywhere throughout the system the equipment ground becomes more or less a necessity, not only with respect to possible high extraneous voltages but quite definitely with respect to the circuit voltage. In the insulated systems experience has shown that the few isolated metal parts that may be associated with the system have little if any need for an equipment ground, and moreover they may be if necessary either insulated from the system, or be of insulating material. But one of the merits of the metallic envelope systems is that they connect together all of the separate metallic parts into one conducting surface throughout the installation, and for this condition a reliable equipment ground is nearly, if not quite, indispensable.

This state of affairs is so obvious, and the effort to preserve the integrity of low voltage grounds has become so laborious, that the Inspectors' Association has recorded a definite recommendation to the effect that non-metallic systems of wiring shall be regarded as preferable where grounding conditions are doubtful or bad. Apparently this recommendation was based mainly upon the cases where ground resistance to earth is likely to be high and is technically sound as far as it goes. There are excellent reasons for applying the same principle to all situations where grounding conditions are likely to be deficient in any respect.

What all this amounts to is that insulation is an effective alternative to grounding. Indeed, it is not too much to say that, from the point of view of the abatement of hazards, insulation will do everything that grounding can do, and do it better. Practically this is not strictly true. Perhaps in theory sufficent insulation could be applied to interior wiring equipment to render it proof against the effects of super-imposed high voltages, but practically it would be an economic impossibility. But in a similar manner, grounding circuits may, in theory, be so safeguarded and

protected that they will maintain their integrity, but there is ample proof that the effort to do this would soon become uneconomic. Indeed there may be some question whether this limit has not already been reached or exceeded, not only economically but also from the standpoint of practicability.

The solution of the problem of the respective merits of insulation and grounding seems to be a rather commonplace one, being no more than common sense. It consists of a judicious application of both methods to produce the best technical and economic result. Over-stressing of either can have only an unhappy result and lead to the evils of evasion and subterfuge which inspectors should most dread among all of their problems.

There may reasonably be a question whether the application of grounding to circuit voltage problems does not already represent an over-straining of this otherwise useful protection, a case of driving a willing horse to death. It is significant that the limitations to the usefulness of grounding have become generally apparent only in recent times, specifically since grounding has been given almost or quite impossible tasks to perform in view of its inherent limitations. It will be recalled that simple grounding as a precaution against high extraneous voltages has worked well for many years and under most diverse conditions of ground resistance; indeed, beyond the obvious duty to obtain the best ground resistance available under the circumstances, it may be said that this practice has not been a serious problem for years. It is only since grounding has been applied for much lower voltages without regard for available facilities that many people have come to doubt its utility.

The theoretical advantages of the non-metallic wiring systems are amply confirmed by the actual performance of millions of installations. When it is considered that the non-metallic systems, in general, are among the oldest of all wiring systems, and that many existing installations are therefore primitive in design and inadequate according to modern ideas of convenience and flexibility, not to mention the fact that large numbers of installations still in useful service are actually very old in years, as electrical things go, it is natural to speculate on the usefulness that a non-metallic system might possess if in other respects it incorporated modern ideas as to circuit and outlet design, circuit capacity and provisions for modern heavy duty appliances and similar features.

It is not intended to disparage either the service record or the present usefulness of the exisitng non-metallic systems, but with due respect to them it may be permissible to consider what features of design a modern system might contain in view of the probability that new and important fields are likely to appear for non-metallic systems generally with the steady extension of electric service and especially with the rewiring of millions of installations that are at present hopelessly underwired for modern requirements.

In this connection the design of installations may be considered as a whole, rather than the physical properties of the materials that might be used. Most design considerations apply equally to all systems of wiring, but they may be of particular interest when used for non-metallic systems on the score of novelty, since there has been little design development among such systems.

There are four outstanding features of design that appear to be important for wiring that is consciously designed for maximum efficiency in modern service; all of them are improvements over conventional practices; some of them appear to be almost indispensable.

The first feature to be considered for incorporation in a designed system for domestic premises, is the recognition of the existence of a load center, its location and establishement. It has been shown by several students of wiring that such load centers are quite definitely located in modern installations, being fixed, naturally, by the location of the major appliances. Generally speaking this location does not coincide at all with the more or less conventionalized points of entry in common use heretofore, such as the attic and the front of the basement. The new meter sequence and the new service entrance cable assemblies appear to be the economic saviors in this situation because they facilitate entry to the premises at or near the load center and because it is generally necessary to rebuild services for the supply of the heavy appliances.

The next two features are related since they both contemplate reform in the design of final circuits. The blind use of radial branch circuits starting from the conventional service entrance point is the most serious deficiency in domestic interior wiring design, and it has persisted, in spite of the great increase in the use of electricity, practically unchanged since the earliest times. At the risk of being flippant, I ask you to contemplate the pitful spectacle of these two or maybe more circuits, starting probably from the most remote and inaccessible corner of the cellar, wandering aimlessly throughout the house picking up outlets where they may; if an outlet is overlooked, even doubling back to supply it. A veritable Toonerville Trolley system these are for amiability, and for service and economy for that matter, for the method leads to excessively long circuits and excessive amounts of inactive wire serving no purpose except to get somewhere.

The Toonerville type of radial final circuit is an antiquity, two measures are suggested to modernize design. First, whether there is a load center or not, dwelling houses should be provided with a feeder for branch circuits and this feeder should be short and stout, in effect a bus with many very short final circuits tapped off from it on each principal level. Naturally such a bus should begin from a load center which also supplies short heavy circuits to the principal appliances, where these are present. Second, loop or ring final circuits should be used instead of radial circuits. The advantages of such circuits are so obvious that it is difficult to see why they have not come into common use long since. The outstanding gain is of course in the double feed which provides conductivity better than No. 12 wire with No. 14 conductors. Besides this standard fittings intended for No. 14 may be used without modification and circuit protection may still be accomplished with 15 ampere fuses.

Between these two features practically all of the present limitations of branch circuits, insufficient capacity, excessive voltage drop and the rest, are amply taken care of. Such a system of design should naturally lead to very short final circuits and many of them, something like one to a room or some reasonable compromise, and by this means the outlet capacity of the circuits, as distinguished from the current capacity, could be made ample for all probable requirements.

The fourth feature to be recommended is the use of surface wiring for the supply of outlets in room interiors. The use of non-metallic wiring, and the systematic development of insulation throughout an installation should facil-

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SOME REFLECTIONS ON EUROPEAN STREET LIGHTING

Measuring Domestic Street and Highway Lighting Possibilities in Conjunction with Overseas Experiments and Demonstrations

By SAMUEL G. HIBBEN

Director of Applied Lighting, Westinghouse Lamp Company, New York

From a recent study of street and highway lighting innovations in several European countries one is convinced of the determination with which the development of improved conditions is being furthered. Perhaps our foreign cousins are coming to believe more unreservedly in the statement that we originated at home, but yet seem to have still disbelieved, "You pay for good street lighting whether you get it or not."

If it be true that on less densely traveled European highways there can still be found economic justification of really good artificial lighting, how much more so would it appear justifiable in the United States! Here the cost of life is no less, nor property insurance neglected. Here our desire or need to move rapidly and safely is certainly as great. Can it be that the lighting engineers overseas view the business possibilities more optimistically than do we, or is there an awakening public consciousness of the value of good street lighting—something that has too long been dormant in the average American community?

In matters of safety and expeditious traveling in this country the job "underfoot" has been and is being done remarkably well. Yet to round out road building, much needs be done overhead. We need a new vision of the relative importance of the uses made of tax monies. Perhaps also we would get a broader view of both civic improvements and personal dividends if we obeyed the Prophet's command, "Lift up thine eyes!"

An installation of sodium vapor lamps staggered along a European rural highway making objects clearly visible by silhouette at distances of half a mile

Although the major portion of city street lighting abroad still remains gas, and therefore on account of incandescent mantles in clear glassware at low mountings it is somewhat "glary," yet the more recent installations make use of the very latest illuminants such as sodium or mercury vapor lamps. The tendency is to mount these electrical units (and the incandescent filament lamps as well) at greater heights than has been practiced in the United States. Ease of accessibility seems willingly sacrificed for improved uniformity of illumination and greatly reduced glare. For example, it is not uncommon to find pendent units from an ornamental bracket or gooseneck pole at heights of 25 feet.

One of the latest European intercity highways employs light sources at 30 feet height, center suspension, on catenary cable supported above the center-line of the roadway. Other typical cases of the newer installations, and exemplifying the radical improvements in past practice, is the placement along highways of light sources that incline towards average sizes at relatively closer spacings, instead of uncomfortably brilliant sources at such wide spacings that the ratio of height to distance would be on the order of 1 to 10. As a matter of fact, ratios of 1 to 2 are being studied, and 1 to 5 are not at all uncommon.

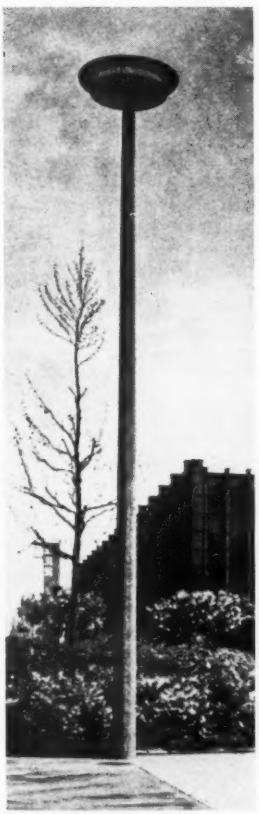
One of the newer suburban installations of high intensity mercury vapor

For a bridge approach, or the entrance to a tunnel, a relatively close spacing of low wattage sodium lamps gives superb visibility on the roadway. On account of monochromatic color the eye actually "sees" better than the camera

lamps in a large European capital employs 275 watt sources spaced 225 feet apart but staggered on both sides of a 50-foot roadway. Other studies are being made of a 300-foot spacing of concrete poles, these extending 42 feet above ground, and with such uniform distribution of light on the roadway that night driving speeds may equal or exceed those of the daytime and with apparently as good visibility.

Some of our more conservative ideas are changed when seeing interurban highways with horizontal illumination that ranges from 1 to 2.5 foot-candles, and vertical intensities from 1 to 3 foot-candles. Values so liberal, coupled with monochromatic color afford really "high-speed" vision. Recall that full moonlight still remains about 0.02 foot-candle, and that we now "illuminate" our million-dollar thoroughfares with an intensity ranging from zero to perhaps five times moonlight! Built at costs generally exceeding $35,000 per mile, these highways of ours would be better investments if they were glarelessly illuminated to even one-tenth of a foot-candle.

Medium high intensity boulevard lighting, but with higher brightness of source and lower mounting height than modern considerations of glare would encourage



Type of suburban post of graceful outline of a style generally popular abroad where widespread illumination is not as vital as the decorative appearance

Of course such European installations are expensive, at least in first cost. One such ideal trial installation cost approximately $3,000 per kilometer or over $4,000 per mile, but the construction is efficient and permanent, the maintenance likely to be rather low, and the usability of the highway is certainly vastly improved.

There seems a tendency abroad at this time to increase lighting intensities on city streets through the use of the new high intensity mercury vapor lamps. It is thought feasible to do this by substituting on an equal wattage basis for filament lamps, although recognizing at the present that mercury lamp bulbs themselves represent a higher maintenance cost for renewals. Perhaps the more pleasing color of the bluish-white mercury light on green foliage has something to do with this preference, coupled with the very evident better seeing conditions.

For interurban highways both mercury and sodium lamps are being studied, but in this service the preference at the moment seems for sodium because it is more adaptable in small sizes and on series circuits, whereas the mercury vapor lamps are as yet limited to medium high voltage multiple distribution. The consensus of opinion among European lighting specialists seems to be that sodium lamps of 4000 and 6000 lumen sizes are ideal for the average highway installation and where pedestrian traffic is largely absent. Experience with wet road surfaces in winter weather and with some conditions of fog and on curving roadways leads to the thought that a source larger than 6000 lumens (with its economically indicated wide spacing) is not best practice for highway lighting.

For residential and second-class business streets in the suburbs of cities one could have no criticism of high mounted mercury vapor sources in sizes ranging from 250 watts (approximately 7500 lumens) to 400 watts (approximately 14,000 lumens). For the latter the present lamp cost of $10 and a fixture cost of about $50 seems acceptable with a downward trend.

It should be noted that the projects being fostered overseas seem predicated on the following sound fundamentals:

A. Traffic accidents must be reduced and night driving made easier and safer. The toll is disturbing.

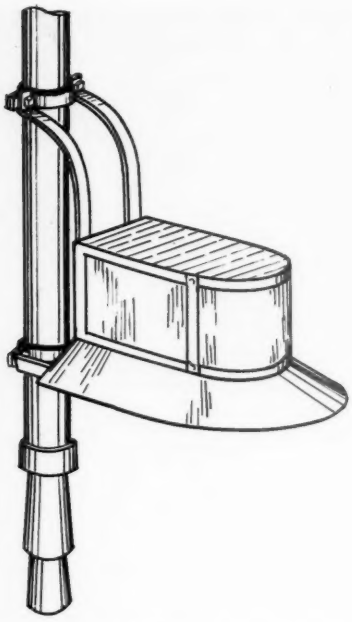
B. The modern roadway represents a great investment and must be used efficiently as near 24 hours each day as possible.

C. New light sources call for new and perhaps radically different shapes of housing. Breaking away from the prosaic in fixture design incites public interest and commendation, and there is room for improvement in the daytime appearance.

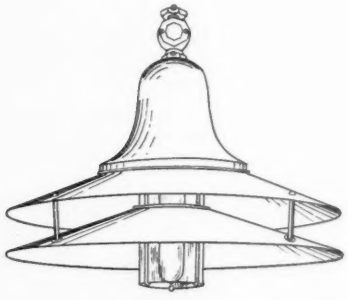
D. With newly available light sources such as sodium and mercury a new tool is at hand, the economic use of which is not fully determined but the promotional value of which is being seized upon as invaluable.

E. The willingness to make trial installations or demonstrations as a cooperative investment, shared jointly by public utility, equipment manufacturer, and lamp manufacturer.

F. A sales instinct or intent, such that the features and virtues of these newer trial



One of the earlier European types of pole bracket for high intensity mercury lamps. Prismatic glassware provides bi-lateral control



Louvered reflector for mercury unit as suspended above a highway intersection

Opaque Metal Reflector

Diffusing Glassware

The more utilitarian European overhead fitting with either an opaque metal reflector or diffusing glassware

installations are presented fully to all citizens, and with sufficient simple accounting to illustrate how their or the government's money is being expended.

Let us pause a moment to draw a lesson from some of the above considerations. If it be true that we in America pay for some 30,000 people killed and almost a million injured annually on our highways—paying through insurance premiums, general property taxes, or the hidden items of "general governmental administration"—and if it be true that a considerable portion of such can be reduced by really adequate street and highway lighting, does it not follow that the heretofore considered inconsequential and dryly technical subject of street lighting must possess features of lively interest to the intelligent citizen?

If even but a fraction of the individual taxpayer's annual share of the $88 cost of traffic accidents can be reduced by better quality or more extensive street and highway lighting, then our present individual annual expenditure on the order of $1.00 per capita for this kind of lighting certainly takes on a different aspect. Neglect if we will all humanitarian considerations and even the item so well appreciated and capitalized abroad—that of civic beauty and pride in the community—we still seem to come around to the original concept that the citizen pays for good street lighting whether he gets it or not. It is the author's conviction that the leaders in many European centers are making up their minds rapidly to get really good street and highway lighting, and they are willing to pay for it—not for the lack of it!

A moment's consideration of the influence of proper illumination on the usability of highways may be interesting. Abroad, the traffic density is not so heavy except in a few centers. But it is increasing, and the hazards are serious. At home we already experience traffic nearly to the thoroughfare's capacity. An average important interurban highway between our larger American cities carries from 8,000 to some 28,000 vehicles daily. We may select for study a major highway along which the average daily flow will be 18,000 vehicles. Almost half or certainly one-third of this traffic occurs during the hours when daylight is inadequate. Such a highway carries traffic equivalent to 18,000 car-miles daily for each mile of its length, of which perhaps 6,000 car-miles are under artificial lighting conditions. During a day's traffic flow there will be a consumption of some 1,800 gallons of gasoline per highway mile, granting 10 car-miles per gallon.

Now if the 3c. per gallon tax be applied there is an average tax income per mile over such a highway of $54 per day or $19,720 per year. A very creditable lighting installation can be had on such a highway for an annual cost in the neighborhood of $1,200 per mile (this including capital charges of interest and amortization) which is actually less than 7 per cent of the gasoline tax income per mile! If we aim, through proper lighting, to increase transportation facilities so that the daily flow of vehicles could be safely boosted some 10

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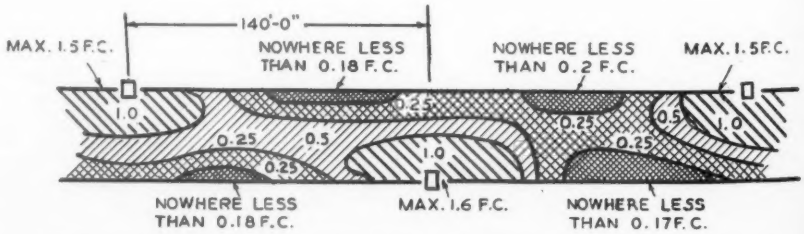


The distribution of illumination from a 400-watt lantern type mercury vapor unit at height of 26 feet

SUPPLEMENTARY FACTORS FOR ESTIMATING NOISE-TO-GROUND FROM MAGNETIC INDUCTION IN JOINT USE CABLE CIRCUITS

This article is based on a report of the Joint Subcommittee on Development and Research of the E. E. I. and the Bell System, which has been recommended as a provisional report.

Engineering Report No. 13* gave formulas and methods for estimating noise in open-wire subscribers' circuits in joint use exposures to power distribution circuits. Certain of the formulas there given, in particular the one for estimating the noise-to-ground, are equally applicable to joint use cable circuits. However, the table of values of K_G to be used in estimating this noise-to-ground was limited to a range of vertical separations from four to eight feet between the power and telephone conductors. In the case of subscriber circuits in cable, this separation may be exceeded and in some cases, separations of the order of 16 feet may be found. In order to extend the table of factors to permit estimates of noise in cables at the wider separations, a further set of values of the factor K_G has been calculated for some of the commoner power-distribution-circuit configurations.

This report is supplementary to Engineering Report No. 13. It is not intended to be complete in itself and reference should be made to Engineering Report No. 13 for a more complete discussion of the technical factors involved.

Values of the Factor K_G

Table 1 summarizes the values of the factor K_G for use in estimating the noise-to-ground in joint use cable circuits. The factor K_G is intended to be used in the formula

$$N_G' = K_G \cdot Kf \cdot I \cdot T \qquad \text{noise units}$$

where

N_G' = noise-to-ground in noise units
Kf = length of the exposure in kilofeet
$I \cdot T$ = product of the power circuit current (balanced or residual) in amperes times its corresponding T.I.F.

As Table 1 indicates, factors are given for induction from either balanced or residual currents and from either single-phase or three-phase power circuits. In the case of induction from residual currents a slight difference in procedure from that followed in Engineering Report No. 13 has been introduced to be consistent with that followed in Engineering Report No. 17 on methods of estimating noise in subscriber circuits at roadway separation. In making estimates of induction from residual current, it is intended that the ground-return current (1) should be used in the formula. It is assumed, therefore, that the process of determining the percentage of the circuit residual current which returns in the ground or other remote paths has been carried out separately. It is recalled that in order to utilize the factor K_G for residual magnetic induction as given in Table 6 of Engineering Report No. 13, it was first necessary to work out an expression involving a factor X which represented the percentage of the residual current returning in remote paths.

The factors given herein apply only to single-phase circuits and three-phase three-wire circuits. No factors are given for three-phase four-wire power circuits because of the variety of possible locations of the neutral wire with reference to the phase wires.

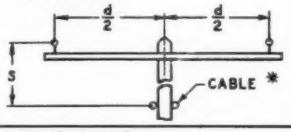
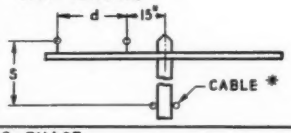
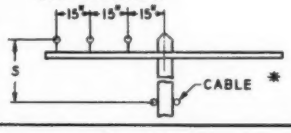
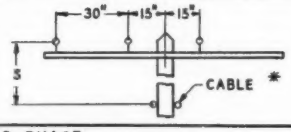
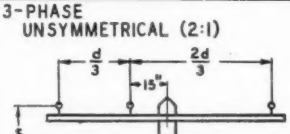
TABLE I

VALUES OF FACTOR K_G

FOR ESTIMATING

NOISE-TO-GROUND IN JOINT-USE CABLE CIRCUITS

FROM BALANCED AND RESIDUAL CURRENTS

A. BALANCED CURRENTS POWER CIRCUIT CONFIGURATION	d (INCHES)	VERTICAL SEPARATION-S (FEET) 4'	6	8	12	16
		VALUES OF K_G				
SINGLE PHASE (CENTERED) 	30	.003	.001	.0007	.0004	.0002
	60	.004	.002	.001	.0004	.0002
	90	.004	.003	.002	.0008	.0005
SINGLE PHASE (OFF CENTER) 	15	.005	.0025	.0015	.0008	.0004
	30	.01	.0054	.0035	.0016	.0009
3-PHASE SYMMETRICAL (OFF CENTER) 	30	.009	.005	.003	.0016	.0009
	60	.009	.006	.0035	.0015	.001
3-PHASE UNSYMMETRICAL (2:1) 	45	.005	.0025	.0014	.0007	.0004
	90	.013	.007	.0035	.0016	.001
B. GROUND-RETURN CURRENT (ALL CONFIGURATIONS)	15-90	.17	.16	.15	.13	.12

* TABULATED VALUES ARE FOR THE CABLE ON EITHER SIDE OF THE POLE.

*Of the Joint Subcommittee on Development and Research.

1 The current designated as the ground-return current may sometimes include components which return to the source in wires on other pole lines. So far as the noise estimates discussed in this report are concerned these are equivalent to components in the ground.

Since it is believed that the majority of power circuits involved in joint use are of horizontal configuration no separate factors have been given for other configurations. A few calculations have indicated that a slight departure from the horizontal configuration toward a triangular configuration does not materially affect the coefficients.

Comparison of the values of K_6 for induction from balanced currents with those for induction from ground-return currents shows that the maximum value for balanced currents is less than 10 per cent of the corresponding value for ground-return current and that the majority of the factors for balanced currents are from 5 per cent down to 1 per cent or less of the factor for ground-return currents. If the factor for balanced current, for instance, is .0015, while the factor for ground-return current is .15, the amount of noise which would result from a given balanced I · T product would be the same as that which would result from a ground-return I · T product which was only 1 per cent of the I · T product for the balanced currents.

The values of K_6 given in this report are not exactly the same as the corresponding values given in Table 6 of Engineering Report No. 13. This is because the values given in this report are for a cable fastened to the side of the pole while the values given in Engineering Report No. 13 are average values for the open-wire pairs of a crossarm. In general those average values may be thought of as applicable to a conductor supported on the crossarm out two or three feet from the center line of the pole.

In this connection it is desired to point out the fact that, particularly for the case of the single-phase power circuit with the wires centered on the pole, a small shift to the side in the position of the cable with respect to the center line of the power circuit may cause a large change in the value of K_6. That the region near the pole is a critical one in this respect may be seen from the consideration that if the cable were located exactly under the center line of the single-phase circuit the longitudinal-circuit induced voltage, and hence the noise-to-ground, from the balanced currents, would theoretically be zero. As the cable moves away from the center line the induction rises very rapidly in the first few inches and then more slowly. In the case of a three-phase power circuit the rate of change is not so rapid but for some of the wire arrangements considerable variations may occur. The values tabulated in this report are all averages of values computed for the cable on two sides of the pole and hence tend to allow for the variation caused by that change in position. For certain of the configurations considered herein this variation may be as much as 30 per cent from the average value; however, for most of the cases tabulated herein the variation is less and for power circuits symmetrically placed about the pole the values on the two sides would be the same. If a different pole arrangement were encountered where the relation of the cable to the power wires differed materially from those shown on Table 1, it would be better to compute a value of K_6 for the particular arrangement than to select a value from the table.

The values of the factor K_6 given in this report were all calculated to give the noise-to-ground which would exist if there were no shielding effect from the sheath of the cable. With suitable connection of the cable sheath to low impedance grounds at both ends of the exposed section the noise-to-ground might be reduced by a factor ranging from about 2 to 4. Data on this effect are given in Section 4.31 on page 87 of Engineering Report 6.

Three different components of noise-to-ground may be computed by means of the values of K_6 given in this report. These are the noise from the balanced currents, the noise from the ground-return current, and, in the case of a three-phase four-wire power circuit, the noise from the neutral-wire current. The resultant noise-to-ground may be obtained by the combination of the components by the r.s.s. method.

E.E.I. COMMITTEE MEETINGS IN CHICAGO

(*Continued from page 327*)

IPCEA Review of Developments in Lead Sheath Manufacturing—T. F. Peterson

Lead Under Stress—R. W. Atkinson

Cooperative AEIC-IPCEA Lead Test Methods—W. F. Davidson and I. T. Faucett

Forenoon of Oct. 24

Report on Lead Sheath Investigations in Chicago—Herman Halperin

IPCEA General Discussion on Non-Metalic Duct Cable—S. J. Rosch

New York and Brooklyn Tests at Higher Operating Temperatures Including the Thinner Walls of Insulation—W. F. Davidson

Micro-examination of Lead—W. F. Davidson

Sperry Tester Experience—A. N. Lawrence.

The afternoon of Oct. 24 has been reserved for inspection trips of interest to those attending these meetings.

Electrical Equipment Committee

The Electrical Equipment Committee will hold an executive session for committee members only Thursday morning, Oct. 25, to discuss organization policies, plans and the program of the committee. At the meetings on Thursday afternoon and Friday, guests interested in the subjects being covered by this committee will be welcome. Representatives of the larger manufacturing companies have accepted an invitation of the chairman to attend these meetings and discuss problems of mutual interest. The program of the meeting is as follows:

Afternoon of Oct. 25

2:00 p. m.—Utilization and Watthour Meter Division—J. F. Fairman.

1. Outline and discussion of work of the division—J. F. Fairman.
2. Watthour Meter Group—
   Report of work accomplished.
   Outline of work proposed.
   Energy Diversion Report — A. E. Silver.
3. Motor and appliance starting currents and effect on customers' voltage regulation—William Shuler.
4. Problems connected with static condenser installations—J. H. Foote.
5. Water Heaters—H. L. Wallau.

Forenoon of Oct. 26

9:00 a. m.—Apparatus and Design Division—H. W. Eales.

1. Outline and discussion of work of the division—H. W. Eales.
2. Report on Electrical Oil Fire Hazards—H. W. Eales.
3. Modernization of Old Equipment—R. A. Hentz.
4. Progress of Oil Circuit Breaker Standardization — George Sutherland.
5. Apparatus and System Troubles—A. H. Sweetnam.

11:30 a. m.—System Engineering Division—S. M. Dean.

1. Outline and discussion of work of the division—S. M. Dean.
2. Report of Committee on Wave Shape of Electrical Equipment—Philip Sporn.
3. Report of Committee on Load and Frequency Control—Philip Sporn.

2:00 p. m.—Operating and Maintenance Division—E. S. Fields.

1. Outline and discussion of work of the division—E. S. Fields.
2. Operating Experience with Reclosing Circuit Breakers.
3. Generation discussion of operating and maintenance problems.

3:30 p. m.—Foreign Practice — A. H. Lawton.

4:00 p. m.—Discussion by manufacturers' representatives.

POWER SALES ITEMS

AIR CONDITIONING

"Air Conditioning Uses and Advantages Studied by Utilities." Heating and Ventilating, July, 1934. The Industrial Press, Publishers, 148 Lafayette Street, New York City.

This article is an abstract of the data submitted by utilities throughout the United States on air conditioning installations in the various business classifications. The complete data are obtainable in book form from the Sales Committee, Edison Electric Institute. Three classifications of air conditioning were studied—industrial, residential and commercial, and the data given includes average horsepower, number of installations, total horsepower, etc.

"Comfort Cooling with Ice." Heating and Ventilating, September, 1934. The Industrial Press, Publishers, 148 Lafayette Street, New York City.

This article decreases the economic advantages of using ice for air conditioning under certain conditions where cooling is desired for short periods only, such as churches, assembly halls, neighborhood theatres, etc.

"Air Conditioning Essential in Boston Bars." Heating and Ventilating, September, 1934. The Industrial Press, Publishers, 148 Lafayette Street, New York City.

This article outlines typical installations of air conditioning and their success in Boston hotel bars.

"Exclusive Haberdashery Modernizes with Unit Cooler." Heating and Ventilating, August, 1934. The Industrial Press, Publishers, 148 Lafayette Street, New York City.

This article gives the details of the air conditioning units recently installed at Finchley's Men's Shop at Fifth Avenue, New York. The refrigeration required is furnished by a 4-ton compressor located in the basement and direct expansion units are suspended from the ceiling in various portions of the store. A decided improvement has been noticed in the agreeableness of both the trade and the sales people. Also spoilage due to perspiration stain has been greatly reduced.

"Consumer Cooling Data." Heating and Ventilating, August, 1934. The Industrial Press, 148 Lafayette Street, New York City.

This is a very condensed digest of the report to client companies issued by the Electric Bond & Share Company. Reasonably complete data were supplied on 118 commercial and industrial installations, which permitted the compilation of very complete typical data in the original book. This abstract gives some of the more interesting data as well as the climatographs for Houston, New Orleans, Phoenix and Spokane. This latter is a comparatively new field and no special significance is attached to it at present although it may prove to be of much value in future studies.

DIESEL ENGINES

"Scale Accumulation in Internal Combustion Engines," by A. E. Hurst, Arctic Chemical & Combustion Engineering Corporation. Power Plant Engineering, September, 1934, p. 418. Technical Publishing Company, 53 West Jackson Boulevard, Chicago, Ill. New York Office, 171 Madison Avenue.

This article outlines some of the difficulties which are experienced in the operation of Diesel engines due to corrosion and pitting of cylinder walls as well as the formation of scale caused by impure cooling water. In several cases, a deterioration of as much as .03 of an inch in four months' operation is observed. Where expert engineering attention is available, this potential difficulty is not serious as it can be combated by adding chemicals to the water, thereby combating corrosion. Scale may be removed by the use of aqua regia. Obviously this is impractical for the small industrialist or farmer.

ELECTRIC FURNACES

"Electric Enameling Oven Efficient After Twelve Years' Service." Electrical World, August 25, 1934, pp. 238-239. McGraw-Hill Publishing Company, Inc., 330 West Forty-second Street, New York City.

This conveyor type furnace was installed in 1922. In all this time the maintenance costs have not exceeded $300. When business conditions require an enlargement of these facilities, it is expected that little important changes will be required in this unit, thus proving that low obsolescence charges are assured when electric furnaces are used.

"Gray Iron," by N. R. Stansel. General Electric Review, September, 1934, pp. 416-421. General Electric Company, Publishers, 1 River Road, Schenectady, New York.

Ordinarily gray iron has a comparatively low tensile strength, the range being between 18,000 and 25,000 pounds per square inch depending on the graphite structure. In electric furnaces it is possible to increase this tensile strength to 40,000 pounds per square inch for plain irons and 60,000 pounds per square inch for special alloy irons. The production of this higher quality iron is made possible by the greater degree of control and temperature with furnace atmosphere and metal composition which is obtainable by the use of the electric furnace.

ELECTRIC MOTORS

"What to Expect of Modern Motor Controls," by George H. Hall. Electrical World, August 25, 1934, pp. 234-237. McGraw-Hill Publishing Company, Inc., 330 West Forty-second Street, New York City.

This is the third and last of a series of articles pertaining to the selection of proper motors and control equipment. In this article Mr. Hall discusses the type and characteristics of controllers, particularly starting devices.

HEATING

"Seven Year Degree Day Records for 49 Cities." Heating and Ventilating, September, 1934. The Industrial Press, Publishers, 148 Lafayette Street, New York City.

This article outlines the fluctuations of degree days for seven heating seasons in various cities located throughout the United States.

INDUSTRIAL ELECTRIFICATION

"How Industry Electrifies." Electrical World, September 1, 1934, pp. 28-29 and 66. McGraw-Hill Publishing Company, Inc., 330 West Forty-Second Street, New York City.

A discussion of sales organizations, programs and methods for increasing power sales through industrial and commercial developments.

OVERLOAD

"Mercury Switch Prevents Overloading of Shop Crane," by Ezra K. Nicholson. Electrical World, May 26, 1934, p. 772. McGraw-Hill Publishing Company, Inc., 330 West Forty-second Street, New York City.

The use of the mercury switch as an overload protective device in a plant of the Du-Pont Company is described.

PAPER MILLS

"Load-Center Distribution Makes Paper Mill Modern," by A. P. Schnyder. Electrical World, May 26, 1934, p. 759. McGraw-Hill Publishing Company, Inc., 330 West Forty-second Street, New York City.

This article shows the advantages of simplicity in layout over the archaic distribution systems formerly in use in mills.

PURCHASED POWER

"Industrial or Utility Power?" by Kerr Atkinson. Electrical World, September 15, 1934, pp. 26-27-62. McGraw-Hill Publishing Company, Inc., 330 West Forty-second Street, New York City.

This article indicates one way in which purchased power can be made most appealing to users. Sinking funds for amortization and return on investment should be the greatest single concern to managements. Protection against risk of investment is the greatest single advantage of purchased power.

REFRIGERATION

"The Diesel Uniblock Refrigeration Compressors," by S. R. Hirsch. Diesel Power, September, 1934, pp. 496-497. Business Journals, Inc., Publishers, 192 Lexington Avenue, New York City.

A general discussion of the problems of Diesel drive for refrigeration compressors, resulting in the development of the Diesel uniblock engine compressor.

"Refrigeration by Steam Jet," by D. W. R. Morgan, Power, August, 1934, pp. 454-456. McGraw-Hill Publishing Company, Inc., 330 West Forty-second Street, New York City.

The what-when-why-where-and how of refrigeration as accomplished by the steam jet system.

WINERIES

"Electricity Helps Make Quality Wines." P. G. & E. Progress, Sept. 1934. Pacific Gas & Electric Company, Publishers, 245 Market Street, San Francisco, Calif.

In this company's territory modern electric facilities and personal skill have been combined in creating a new major industry.

INCANDESCENT LAMP STATISTICS

(*Continued from page* 335)

changes in rated life, it is necessary to take it into account, and the average statistics in the future will be weighted according to the number of lamp-hours represented by the different types and sizes, i.e., by the product of quantity and rated life.

The distribution of lamps shipped, by voltage, as shown in Tables IV and V would probably be but little affected by weighting according to lamp-hours, inasmuch as the voltage distribution of the more important types that differ from the previous life values is essentially the same as that of the others.

GROUNDING AND WIRING SYSTEMS

(*Continued from page* 345)

itate new features of design for the materials employed which would provide maximum safety and flexibility. It should be borne in mind that outlet inadequacy arises mainly through changes in interiors, granting that a sufficient number of them are provided in the first place. The matter of relocating an outlet and using it is, with concealed systems, usually not merely a matter for the wireman, but one that involves the carpenter, paperhanger, plasterer and perhaps others as well. Utility sales promotion men at least, know all too well the familiar alibi of the consumer who "would have his house rewired if it didn't mean tearing it apart" and this is not often a mere alibi, by any means. Naturally surface wiring eliminates or minimizes such difficulties, and from the inspector's point of view, gives substantial assurance that outlets will remain in active service and that additional outlets will be provided promptly when they are needed.

EUROPEAN STREET LIGHTING

(*Continued from page* 348)

per cent it would seem that this extra usefulness would automatically (through an existing tax system alone) much more than defray the lighting costs.

The fact is recognized that improved highway lighting will not in itself immediately increase vehicular traffic *in toto*, nor need that be a primary object, but it does seem that better lighting can be had if its worth be appreciated and its cost properly apportioned.

It is unthinkable that we in this country will lag behind the ultra-progressive European street and highway lighting experiments and demonstrations. From the viewpoint of the citizen the industry may acknowledge the faults of having learned well but taught poorly. Cooperative action for and with the public's interest, the awakening of a more active public consciousness in street lighting matters, and our own pride ought to be sufficient incentives towards a renaissance of street and highway lighting activities.

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CONVENTIONS AND MEETINGS

OCTOBER

1-5 American Welding Society, Hotel New Yorker, New York, N. Y.
5-6 Empire State Gas and Electric Association, Westchester Country Club, Rye, N. Y.
11-19 Economic Conference of Engineers, Stevens Institute of Technology, Johnsonburg, N. J.
17-20 National Electrical Manufacturers Association, Chicago, Ill.
19 Sales Committee, EEI, Palmer House, Chicago, Ill.
22-23 Prime Movers Committee, EEI, Edgewater Beach Hotel, Chicago, Ill.
22-23 Transmission and Distribution Committee, EEI, Edgewater Beach Hotel, Chicago, Ill.
25-26 Electrical Equipment Committee, Edgewater Beach Hotel, Chicago, Ill.
29-31 American Gas Association, Auditorium, Atlantic City, N. J.

NOVEMBER

1-2 American Gas Association, Auditorium, Atlantic City, N. J.
12-15 National Association of Railroad and Utilities Commissioners, Willard Hotel, Washington, D. C.

DECEMBER

3-4 National Industrial Council, Waldorf Astoria Hotel, New York, N. Y.
3-8 Eleventh National Exposition of Power and Mechanical Engineering, Grand Central Palace, New York, N. Y.

STATEMENT OF THE OWNERSHIP, MANAGEMENT, CIRCULATION, ETC., REQUIRED BY THE ACT OF CONGRESS OF MARCH 3, 1933

Of EDISON ELECTRIC INSTITUTE BULLETIN, published monthly at Philadelphia, Pa., for October 1, 1934.

State of New York.
County of New York.

Before me, a Notary Public in and for the State and county aforesaid, personally appeared Wilgar Coleman, who, having been duly sworn according to law, deposes and says that he is the Editor of the EDISON ELECTRIC INSTITUTE BULLETIN, and that the following is to the best of his knowledge and belief, a true statement of the ownership, management . . . etc., of the aforesaid publication for the date shown in the above caption, required by the Act of March 3, 1933, embodied in section 537, Postal Laws and Regulations . . . to wit:

1. That the names and addresses of the publisher, editor, managing editor and business managers are: Publisher, EDISON ELECTRIC INSTITUTE, 420 Lexington Avenue, New York City; Editor, Wilgar Coleman, 420 Lexington Avenue, New York City; Managing Editor, none; Business Manager, none.

2. That the owners are: EDISON ELECTRIC INSTITUTE, 420 Lexington Avenue, New York City, a mutual organization, not incorporated. Thomas N. McCarter, President, Newark, N. J.; Edward Reynolds, Jr., Treasurer, New York, N. Y.; Bernard F. Weadock, Vice-President and Managing Director, New York, N. Y.

3. That the known bondholders, mortgagees and other security holders owning or holding 1 per cent or more of total amount of bonds, mortgages or other securities are: None.

WILGAR COLEMAN,
Editor.

Sworn to and subscribed before me this 1st day of October, 1934.

(Seal) JESSIE R. GERMOND,
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(My commission expires March 30, 1936.)

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